

# Proceedings of the Musical Association

Musical  
Association (Great  
Britain)

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PROCEEDINGS  
OF THE  
MUSICAL ASSOCIATION

FOR THE INVESTIGATION AND  
DISCUSSION OF SUBJECTS CONNECTED WITH THE  
ART AND SCIENCE OF MUSIC.

FOUNDED MAY 20, 1874.

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THIRTEENTH Session, 1886-7.

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LONDON:  
STANLEY LUCAS, WHEELER & CO., 46, NEW BOND STREET, W.  
1887.

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Aug 30, 2013



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# RULES AND REGULATIONS

*Passed at Four Special General Meetings of the Members, held at 27, Harley Street, W., on February 7 and April 3, 1878, on January 6, 1879, and on December 6, 1886.*

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## OBJECTS AND CONSTITUTION.

THIS Association is called the "Musical Association" and is formed for the investigation and discussion of subjects connected with the Art, Science, and History of Music; and is intended to be similar in its organisation to existing Learned Societies.

It is not intended that the Association shall give concerts, or undertake any publications other than those of their own Proceedings, or the Papers read at their Meetings.

## MEMBERS.

The Association shall consist of practical and theoretical musicians, as well as those whose researches have been directed to the science of acoustics, the history of the art, of other kindred subjects.

Any person desirous of being admitted into the Association must be proposed by two members. Foreigners resident abroad and distinguished in the Art, Science, or Literature of Music, may be recommended by the Council for election as Honorary Members of the Association.

Elections will take place by ballot of the members present at any of the ordinary meetings, and one adverse vote in four shall exclude.

No newly elected member shall be entitled to attend the meetings until the annual subscription be paid.

## SUBSCRIPTION.

The annual subscription to the Association is one guinea, which shall become due on the 1st of November in each year.

Any member may, upon or at any time after election, become a life member of the Association by payment of a composition of £100, in lieu of future annual subscriptions, but in addition to any annual subscription previously paid or due from such member. Such name shall from time to time be entered in legal security in the names of Trustees, to be appointed by the Council.

Should members desire to withdraw from the Association, they should give notice to the Hon. Sec. on or before the first of October.

## MEETINGS.

An ordinary meeting shall be held on the first Monday in every month, from November to June inclusive, at 9 a.m., where, after the despatch of ordinary business, Papers will be read and discussed.

An annual general meeting of members only shall be held at 4 p.m. on the last Monday in October, to receive and deliberate on the Report of the Council, and to elect the Council and officers for the ensuing year.

Special general meetings may be summoned whenever the Council may consider it necessary; and they shall be at all times bound to do so on receiving a requisition in writing from five members, specifying the nature of the business to be transacted. At least one week's notice of such special meeting shall be given by circular to every member, and ten members present at any general meeting shall constitute a quorum.

Every member shall have the privilege of introducing one visitor at the ordinary meetings, on writing the name in a book provided for that purpose, or sending a written order.

## COMMUNICATIONS.

Papers proposed to be read at the meetings may treat of any subject connected with the Art, Science, or History of Music, Acoustics, and other kindred subjects.

Papers will be received from or through any member of the Association.

Experiments and performances may be introduced, when limited to the illustration of the Paper read.

All communications read will become thenceforth the property of the Association (unless there shall have been some previous arrangements to the contrary), and the Council may publish the same in any way and at any time they may think proper.

## REPORTS.

A Report of the Proceedings of the Association, including the Papers read or abstracts of the same, and abstracts of the Discussions, shall be printed and distributed to the members as soon as possible after the end of each session.

This Report will be arranged and edited by the Honorary Secretary, under the direction of the Council.

## COUNCIL AND OFFICERS.

The management of the affairs of the Association shall be vested in a Council, to be elected by ballot at the general meeting of the members on the last Monday in October.

The Council shall consist of a President, Vice-Presidents, and ten ordinary members of the Association.

The Honorary Secretary of the Association shall be *ex officio* an ordinary member of Council.

The President, Vice-Presidents, Auditors, and five ordinary members of the Council shall retire every year, but shall be eligible for re-election.

At the annual general meeting in October, the Council shall present a balloting list, showing the names of the persons whom they propose for the offices of President, Vice-Presidents, and ordinary members of Council for the ensuing year. A copy of this list shall be given to each member present.

In voting, each member may erase any name or names from the balloting list, and may substitute the name or names of any other person or persons whom he considers eligible for each respective office; but the number of names on the list, after such erasure or substitution, must not exceed the number to be elected to the respective offices as above enumerated. Those lists which do not accord with these directions shall be rejected.

The Chairman of the meeting shall cause the balloting papers to be collected, and after they have been examined by himself and two scrutineers, to be appointed by the members, he shall report to the meeting the result of such examination, and shall then destroy the balloting papers. Auditors shall be appointed at the annual general meeting by the members, and the statement of accounts shall be sent by the Treasurer to the Auditors, and be verified by them to the Secretary in time to enable the Council to judge of the prospects of the Association, and to prepare their report in accordance therewith.

The Council and officers shall meet as often as the business of the Association may require, and at every meeting three members of Council shall constitute a quorum.

## ENACTMENT OR ALTERATION OF RULES AND REGULATIONS.

No rules and regulations can be enacted, altered, or rescinded, except at a special meeting of members summoned for the express purpose, the summons stating distinctly and fully the matter to be brought under consideration.



# MUSICAL ASSOCIATION.

FOR THE INVESTIGATION AND DISCUSSION OF SUBJECTS  
CONNECTED WITH THE ART AND SCIENCE OF MUSIC

FOUNDED MAY 29, 1874.

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Macnair, Harry G., Esq.

# MUSICAL ASSOCIATION.

TWELFTH SESSION, 1885-86.

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## REPORT.

THE Annual General Meeting of the Musical Association was held at No. 27, Harley Street, W., on Monday, October 25, 1886:

Dr. W. H. MOORE in the Chair.

*The following Report of the Council was read by the Hon. Secretary:—*

In accordance with the Rules of the Musical Association the Council presents to its Members its Annual Report of the Twelfth Session.

During its course the usual series of eight monthly meetings has been held, and papers have been read by the following gentlemen: Rev. M. R. SACREW; E. PROUT, Esq., B.A.; J. S. SHEDDEN, Esq.; Rev. Sir F. A. G. OSWALD, Bart.; F. PRAGER, Esq.; H. C. BARTON, Esq.; D. J. BLANCHET, Esq., and A. J. HIRSH, Esq.

The Council, in connection with the subject of the attendance at the Meetings, desires to remind Members—Country Members especially—of their privilege of introducing a friend at each Meeting, either by written order or personally.

The Twelfth Volume of the *Proceedings* of the Musical Association (which has been forwarded to every Member) contains a valuable addition to current musical literature and knowledge. The Council strongly urges upon the Members generally to make the existence and scope of the Association more widely known, and desires to remind them that communications or papers will be received by, or through Members, subject to the approval of Council.

The Balance Sheet, duly audited, lies upon the table for inspection. The Council congratulates the Members on the fact that a further sum of £100 has been invested, and that the accounts show the probability of an additional investment of a like sum during the present session.

The attention of Members is again called to the inconvenience that results from irregularity in the payment of Subscriptions. At the beginning of each Session the Council has to undertake certain necessary liabilities in good faith that the Annual Subscriptions will be promptly paid; when, however, the Members forget this necessary duty, additional expenses are incurred which are an objectionable expenditure of the funds.

In accordance with the Rules, five ordinary Members of Council retire; Messrs. STEPHENS, FRASER, GLADSTONE, COKE, and CRAWFORD. These gentlemen are eligible for re-election, but Members are reminded of their right to nominate other gentlemen to serve on the Council.

# THE MUSICAL ASSOCIATION.

Financial Year from Oct., 1885, to Oct., 1886.

Dr. NON. TREASURER'S STATEMENT OF RECEIPTS AND DISBURSEMENTS. Cr.

1885.		1886.		1887.	
Oct. 12.—To Balance from last Account .. ..		Oct. 12.—By Expenses of Session .. ..		Oct. 12.—By .. ..	
" Subscriptions received :-		" Profound of £100 of per cent. profit .. ..		" Balance forward .. ..	
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" 2024 .. ..		p		s	

November 1, 1886.

MR. SOUTHGATE  
IN THE CHAIR.

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THE REGISTERS OF THE VOICE.

AN EXTENSIVE LECTURE BY EMIL BENNETT.

I have to say a few words to you this afternoon on the Registers of the Human Voice. My definition of the registers is this:—A register consists of a series of tones produced by the same mechanism. If we were to hear two men outside playing a scale, one commencing on a double bass, and the other continuing, say, on a violoncelle, without the scale being interrupted, we should know exactly where the one left off and where the other one came in. In a similar way several series of tones are produced by different mechanisms in the human voice, and each of such series I term a register; the mechanism of some of the registers may be seen just the same as the tones of these registers may be heard.

There are two ways of seeing the mechanism by which the registers of the human voice are produced. In the first place, you may see it in the usual way by laryngoscopic observation, and, in the second place, you may see it by "through-illumination." So far as laryngoscopic observation is concerned, we have heard a great deal about that of late, rather more than some people care, and I think it is pretty well known by this time how these observations are carried on. You have a little mirror, which is warmed, so that it may not be dimmed by the moisture of the breath. You hold that in a person's throat, throw a strong light upon it, which is reflected down into the larynx, and then, by means of this mirror, you see what is going on in the larynx—to a certain extent. You see what is taking place on the surface of the vocal ligaments; but cannot see below them. You see right into the wind-pipe under certain favourable circumstances; but you cannot see what is going on below the vocal ligaments, and you cannot see what is going on in their bulk.

Talking first about the results which are to be obtained by means of the laryngoscope, suppose we look down a person's throat, and let that person sing. Then we see three different

appearances in the larynx. I am not now speaking of minor appearances, but simply of broad facts. We see, first of all, while a man is singing his lower tones, the two vocal ligaments more or less firmly held together, and we see them agitated by full, loose, vibrations, through their entire thickness. This is one mechanism, and while a man sings with this kind of mechanism we speak of him as singing in the "thick" register. Now he goes beyond this mechanism—that is to say, he sings up the scale until he comes to a point where he can go no further without making tremendous efforts, and if he wishes to sing higher still he has to change the mechanism; he has to put on one side the instrument upon which he has been playing hitherto, and he has to take up another. When he performs upon this new instrument we see a different picture. The vocal ligaments do not any longer vibrate through their whole thickness, the vibrations disappear altogether. The vocal ligaments seem to stand almost still, and what little vibrations there are, are confined to the thin inner edges of the vocal ligaments, and there is an elliptical slit between them. When a person sings with this mechanism, then we say he is singing in the "thin" register.

Now, if we allow a lady or a child to take the place of our imaginary male singer who has been singing so far, and let this female singer or the child commence where the male singer left off, and sing up the scale again, then we shall find that these new singers also, after a certain time, will come to a point where they will be stopped, beyond which they could only go by making a very great effort; and here if you wish them to sing higher still they also will have to put away this second instrument, as it were, and take instead of it a third. Whenever that takes place we shall see a new picture; we shall no longer see the slit between the vocal ligaments extending from one end of them to the other, but we shall see it confined to the anterior part of the vocal ligaments—that is to say, we shall see the posterior part of the vocal ligaments held very firmly together, and we shall see a little oval orifice in the front part of the vocal ligaments, the inner edges of which are vibrating, and which, on the pitch of the voice continues to be raised, will get smaller and smaller. I shall never forget the impression which this third register, commonly called the head register, but which we prefer to call the "small" register, made upon me when I saw it for the first time. It is a good many years ago now, and I was then only beginning these investigations, so that I had really to discover a great many facts for myself, or to re-discover for myself a great many facts which had been really ascertained by other people before; but this makes the whole thing, in my estimation, none the less



valuable. I remember meeting, some eighteen or twenty years ago, a little Cathedral boy from Berlin, in one of our German forests, where I happened to be spending my holiday. At that time I always used to carry a laryngoscope in my pocket, and I was in the habit of laying hold of any one who was patient enough to submit to me, and to place my mirror at the back of his mouth, to try what I could see; of course there is nothing like sunshine for operating, and of that sunshine we had at that time fortunately a great deal. This little boy happened to be a very favourable subject. There was no difficulty to overcome with him. The throats of some people are so sensitive that the moment you touch them with a mirror you find it is useless to experiment with them. That was not so with him; from the beginning he bore it well, so that after a very short time he was able to sing up and down the scale as though he had no mirror in his throat at all. Now my idea up to that time had been that the voice was fundamentally the result of the vibrations of the vocal ligaments. That is, of course, perfectly true, but when I came to look down this boy's throat the moment he sang high tones, I was startled by discovering that there seemed to be a place, as it were, cut out of one of the vocal ligaments. A crescent shaped piece appeared to be cut out, and that, to my mind, seemed altogether to upset the fundamental notion of the production of the voice, and I could not understand it at all. I continued to operate upon him, and presently saw, by shifting my mirror a little, that the same thing took place on the other side. Then I further noticed that this did not take place at all pitches. It did not take place in the middle part of the voice, but the moment the boy sang above *F* or *F*<sub>2</sub> on the fifth line of the treble clef, this appearance took place. It then dawned upon me that that must be a new mechanism. Since then I have made these observations on many hundreds of people, and whenever I have had an opportunity of seeing the mechanism of these high tones, I have invariably found it to be the same. So that I assert with all confidence, and without any fear of contradiction, that regarding the appearances in the throat, so far as they may be observed by means of the laryngoscope, we can speak of three mechanisms in the human voice; the "thick" register, in which the tones are produced by vibrations through the whole thickness of the vocal ligaments; the "thin" register, in which the tones are produced by vibrations confined to the thin inner edges; and the "small" register, in which the tones are produced by the vibrations of a small part of the vocal ligaments only.

So far, so good. This has shown us a great deal we did not know before, and when we compare the data at which we arrived by means of these investigations with all that we

learn through the ear, then we shall be able to base a very satisfactory theory upon data, which will at least enable us to teach without any fear of doing mischief. We may not all be able to produce Farinelli or Jerro Lind's, but we shall certainly be able to avoid ruining voices wholesale.

This is one way of looking at things, when we try to ascertain the mechanism of the human voice. But there is another way, and that is by trying to get a view of the vocal apparatus by means of "through-illumination." That is not so well known. These experiments were first made some twenty-five or thirty years ago by Dr. Caspach, of Perth. He did not carry them on to any great extent, but I think very little has escaped him with regard to the human voice; and these experiments have also been repeated by Dr. Schenk who now, I think, lives in Vienna, but who then lived in Stuttgart. With the exception of these two, I do not know of anyone who has carried on these experiments. I was anxious to do everything which was possible to get at the real truth of the matter, and so astutely myself as to how things were really done. I, therefore, with the assistance of my friend, Dr. Lennox Browne, constructed an instrument containing an electric light of ten thousand candle power, which was enclosed in a box lined with iron, so that, although there was this terrific light, yet the moment the gas in the room was turned down it was pitch dark. I dare say you have all noticed before now the light of the sun shining through a person's ears making them semi-transparent; also how the edges of the fingers become transparent if we try to shield our eyes from the light of the sun. In a similar way we can "through-illuminate" the throat, and it is unnecessary to say that the thinner and the leaner the subject, the better we shall succeed.

Now let me explain to you how the experiment was carried on, and I hope this may be interesting to you, because we certainly have learnt a great deal from it. I had, as I said before, an electric light of 10,000 candle power, which was enclosed in a case, so that you could see nothing of it in the room. Supposing I had that case here on my right hand; in the front part of that case there is a lens through which the light is shining; it does not shine into the room, but into a cylinder, and the cylinder, just where it comes opposite to me, is bent at right angles, and the second tube touches my throat with something like the mouthpiece of a speaking-trumpet. At the angle where the two tubes meet there is a mirror, so that this enormous light, which is concentrated and shining through this lens, was thrown on the slanting mirror, and then, by means of that mirror, on to my throat. The mouthpiece was put against the throat just below the larynx, and a piece of

black cloth attached which was tied round my neck, so that when I stood in that position I had a most intense light against my throat, but the room itself was pitch dark. I regret I am not honoured by the attendance of Dr. Dundas Grant, who, with Dr. Lennox Browne, happened to be present at this experiment, because he would have been able to confirm what I am going to tell you. I had this enormous light on my throat although no one could see anything of it, the room being quite dark. The moment I opened my mouth, any one looking into it would see in the act of breathing, for which the glottis is open, the light shining through and illuminating the upper part of the throat. I then took a laryngeal mirror and held it at the back of my throat in the orthodox way, just as it done in the ordinary laryngoscopic observation. It was warmed so as not to be dimmed by moisture of the breath. I had a second mirror facing me in which I could see any image that might be reflected in the laryngeal mirror, which, however, did not interfere with the view of anybody facing me, so that a person standing opposite me and I could simultaneously see any appearances in the mirror at the back of my throat. While I was singing in the thick register very little was seen. Of course, at the time I took an inspiration, the glottis opened, and there was a great amount of light which was reflected in the laryngeal mirror. Then we also saw the outline of the vocal ligaments; but the moment I closed my glottis again in the act of singing this light disappeared, and we saw very little, it was almost absolute darkness, only just the outer edges of the vocal ligaments being discernible. If you imagine the vocal ligaments cut through, the section would be triangular; they are broad at the outer edges and narrow at the inner edges, so that at these inner edges some light was shining through, but at the outer edges we saw very little in the act of singing. When I went beyond the "thick" register, commonly called the "chest" register, the moment I put away that mechanism and sang in the "thin" register, or, as it is commonly called, the "falsetto," we saw quite a different picture. We then immediately saw that the bulk of the ligaments had, to a very great extent, collapsed; whereas they had before been opaque, they now became quite transparent. We could see right through them, and the higher I sang, the thinner they appeared to become, and the more transparent they were. We saw the intensity of the light I had in my throat as distinctly as possible, and that shows very clearly in another way the mechanism of the "thick" register, and of the "thin" register; and it also shows at the same time the great approximations of these parts.

So far as terms are concerned, I think it is a very great

pity that there are so many, the majority being really meaningless ones. I find invariably that when I want to have a discussion with anyone on the subject of registers, it becomes necessary, first, to define terms, because one man means one thing by a given term, and another man means quite another thing by the same term, and I frequently find that while two people are using the same term they are really talking about two totally different things. Now these terms, "thick" register and "thin" register, are most admirable, because they are absolutely true. What can you find more to the point than the term "thick" register, when we now know for a certain fact that the vocal ligaments actually are very thick while producing that series of tones; and what can you find more appropriate and more to the point than the term "thin" register, when we now know for a certain fact that the vocal ligaments nearly collapse in that register and become quite thin? That is a point which the inventor of these terms, the late lamented Mr. John Carver, did not know. He was a great educationalist, as you are aware, and was dissatisfied with the existing terms, which are very vague, being based on families and sensations, and he tried to substitute for them terms which should mean something, and have a scientific basis. By the light which he then had, he selected these terms, "thick," "thin," and "small," but, as I said just now, he did not know himself at the time how true these terms really were; we have only found that out since his death, by means of the investigations which we carried on with "through illumination" of the throat. I hope these investigations will help to introduce the term "thick," "thin," and "small" more generally, because then there will be no difficulty in one person understanding another.

When I had done with these demonstrations by means of "through-illumination" on myself, I got my daughter to take my place. Her throat is very favourably constructed for these experiments, and it is very easy to see the mechanisms in it; in fact, easier than it is in mine. At the same time, she has had the advantage of being trained in these things from early childhood, so that she never had any difficulty to overcome. When we put her in my place, and made the same investigations upon her, we saw something with which I had been previously familiar, and of which a great many other people have been cognizant, but which was nevertheless demonstrated once more in the most striking manner. We had an ocular demonstration of the fact that the great break in the human voice takes place exactly at the same point in pitch in women, children, and men. It is a very great mistake to speak of the soprano voice as simply a reproduction of the tenor voice an octave higher, and of the contralto

voice as a reproduction of the bass voice an octave higher. Consequently it is also a great mistake to speak of the great break in the human voice as taking place relatively at the same place in different people. It does nothing of the kind; it takes place at or about the same absolute pitch in men, women, and children—namely, at middle *F*. That is a very important point in the training of voices. It was found that while I sang in the "thick" register up to *F*, above the second ledger line of the bass clef, and then changed into the "thin," it was exactly the same with my daughter; she sang up to the same *F* in the "thick" register, and then she changed into the "thin" register, the only difference between her singing and mine was that she was able to sing very much higher in this "thin" register than I was, and therefore we could see very much more of the high tones than we could ever hope to see in a man. In her case the vocal fragments became so thin that eventually there really seemed nothing but a film covering the light.

Everything I have told you so far goes to prove that the frequently received idea of a soprano being nothing but a tenor an octave higher, and a contralto nothing but a bass an octave higher, is a mistaken one. It also proves that the voice is a disposition which, so to speak, has been distributed amongst children, women, and men in such a way that the upper part of it has been given to women and to children, and the lower part has been given to men, and the great break between the upper part and the lower part of the voice takes place exactly in the middle portion of the voice. I have here a diagram, by means of which I have endeavoured to make that clear. The column on the left represents the male voice and on the right the female. Up to *F*, the first space in the treble clef, is the "thick" register; above it is the "thin" register. In the female voice that goes up to the *F*, the octave above, and then the register above is the "small" register. There are also some sub-divisions, but the great break between the "thick" and "thin" takes place in all singers at about the same point in pitch.

The sub-divisions shown on this chart indicate minor breaks. That is a point which some people do not believe in at all. I believe in it very strongly, and I am fully convinced that there is not only the "thick" register, but a lower "thick" and an upper "thick," and not only a "thin" register, but a lower "thin" and an upper "thin." In point of fact, so far as I am able to judge, and so far as experience has aided me, we have really, taking the human voice as one instrument, five registers and five mechanisms, the "lower thick" and "upper thick," the "lower thin" and "upper thin," and the "small." Now these sub-divisions are very difficult to demonstrate by means of the laryngoscope, as well as by

means of "through-dilatation" of the throat. The changes are so exceedingly minute that the subject is open to argument. The changes are so very small that one man may really fancy he sees one thing, and another man may fancy he sees another thing. It is very difficult really to lay down anything like a law here. Yet some changes do take place, and if we listen very carefully to a variety of voices we shall have no difficulty in recognising them. I may tell you that frequently you find these five registers in one single voice. I have repeatedly had an opportunity of demonstrating five registers in one single voice, and I had hoped to have that opportunity here this afternoon. Unfortunately the young lady who was to have come has been prevented, so that I cannot give you the demonstration; but I remember some years ago giving a lecture in Edinburgh, at the invitation of a committee of medical men, some of whom I met afterwards at a ladies' college where they had older girls than you generally find in schools, some from sixteen to eighteen years of age, and amongst these girls there were two in whose case we found all the five registers. They had contralto voices; they still had their head register or "small" register, which, in after life, is generally lost as the voice settles, so that in the case of these two voices, we could hear the five registers just as plainly and distinctly as we could have seen five different colours, and the gentlemen who were there to meet me and to hear this demonstration were all perfectly satisfied about the matter.

Of course it is quite useless to talk about registers as demonstrated in the case of accomplished singers. Why, the singing master who is not capable, when he gets a fair chance, of hearing the registers in any given voice, and of equalising them so that you cannot distinguish one from the other, is not worth his salt. That is one of the very things which he must be able to do. If he cannot do it then he does not understand his business. Therefore, I say, when you want to ascertain the registers, or to demonstrate the registers, it is of no use to rely to accomplished singers. In fact, I have no hesitation in saying that the more accomplished they are, the more equal their voices are naturally from the beginning, and the more afterwards they have learnt to blend the different registers, the less you can recognise them. You do not hear any difference as the singer goes up and down the scale, and if you come to look down the throat by means of the laryngoscope, of course you cannot see any difference. How can you expect to see a difference in the mechanism when there is no difference in the voice itself? It is quite unreasonable to expect that. If you take a young voice, in which the registers are as marked as possible, so that even the uneducated ear shall recognise them without

any difficulty, and then look down such a person's throat and—given a throat that will at all stand the touch with the laryngeal mirror—you will have no difficulty in at least discovering without a shadow of a doubt the three mechanisms—the “thick,” the “thin,” and the “small.”

I do not know whether there is any need for me to refer to these diagrams further. In the case of the male voice, I may say the point where the change takes place from the “lower thick” into the “upper thick” is variable, but in the case of the female voice these changes are very much less noticeable, and the great break between the “thin” and the “small” takes place almost invariably at the same place, at all events, it is quite safe to say it takes place at or about the same place. Now, by way of illustration, I will just tell you one thing. This is the newest illustration that has come under my notice, and it is only a few days old. I may tell you that, as my own teaching, speaking of women's voices, I commence as the middle of the voice. I confine them to the compass of a fifth from *E* to *B*, no more, and in that compass they are taught to do everything with their voices that it is possible to do. When they have learnt that, then, in the case of sopranoes, I go up from *E* to *E*, taking the octave in that way, and in the case of contraltos I go down from *B* to the lower *B*. First of all I develop the “lower thin” register, and then take in the “upper thick” register, and in that way I have the octave. The other day I had taken a lady, for the first time, into this “upper thick” register, so that she had, for the first time, been singing from *B* to the lower *B*. When she came to me the next time, she said, “Oh, Mr. Schriek, I want to ask you a question—this is a very curious thing; I can sing that low *B* in two totally different ways.” Of course that immediately made me smile, because I knew what was coming. I said, “What was the situation, just sing it.” Then she sang that *B* in two different ways, and, of course, she sang the one in the “lower thick” and the other in the “upper thick.” That was the explanation of the whole thing, and the *B* is just about the place where the voice changes from the “lower thick” into the “upper thick.” When she had gone down to that *B* she found she could either sing it in one register or in the other, and was immensely startled, though to me it was perfectly plain. When I explained it to her she also understood it. That is just one of those little illustrations which one comes across frequently, which are so powerful as a stimulus in convincing one of the correctness of one's theories which have been built up in the course of years. The same thing takes place in the “thin” register, you find the same change from the “lower thin” into the “upper thin” very frequently.

I do not know that I have anything further to say; in fact, I am afraid, as it is, I have exceeded the time usually allotted to these lectures. Just let me sum up, in a very few words, what I wanted really to bring before the Association this evening. I wanted to emphasize these two facts—first of all that the human voice is a diapason which has been distributed amongst mankind in such a way that the upper part has been given to children and women and the lower part to men, and that the great break between the “thick” register and the “thin” register occurs in all voices, whether they be the voices of children, of women, or of men, at or about the same place—namely, middle *F*. That is one of my great points. In the second place, I wanted to emphasize the fact that the soprano is not, as is frequently supposed, a tenor an octave higher, and the contralto a bass an octave higher, and that there are not only two registers in the human voice, or, as some people would say, three, but that there are, in point of fact, really five, although out of those five, by means of laryngoscopic observation, whether with reflected light or with “through-illumination,” we can only demonstrate three.

## DISCUSSION.

**THE CHAIRMAN.**—Ladies and Gentlemen, it will be our first duty, which I am sure will be heartily admitted, to return a vote of thanks to Mr. Dehnke for his very interesting paper. It may be asked what good are these investigations, but it continually happens that research of all kinds adds something to the stock of human knowledge; in this case I think we shall agree that the information he has given us will tend to preserve and help nature in her most perfect musical instrument, the human voice. I will put the vote of thanks, and then invite discussion on this interesting lecture.

(The resolution was carried unanimously.)

**MR. J. S. CUSWELL.**—I limit myself now entirely to the practical view of the matter. I do not take up the physiological or scientific points, but I have very ample experience in going about the country and observing the results of this system of voice training. In its essential features it is the same as that which is employed by the Texas Sol-faists generally, and you know that the teachers of that system have under their control a very vast number of young people and adults. I can testify by experience that the consequence of adopting this plan of voice training is that the voices are conserved, that they last well, that they develop in



strength and in sweetness, and it seems to me that that is really the proper test of any system of voice training. "The proof of the pudding is in the eating," and there is nothing like bringing a system of voice training to a practical test. I find this system meets most fully the demands of the choral trainer, and I believe also of the teachers of solo singing.

Mr. DUNSTON.—My experience has been chiefly confined to voices from the age of about seventeen to twenty-four, and for about ten years past I have been directly and indirectly concerned in training such voices. They come to me as teachers; they have been pupil teachers, and come to the training college for a course of training in order to prepare for the work of teaching in elementary schools, and so on. My experience with regard to both sexes has shown me that what Mr. Behrke has told you to-night is entirely correct in every point. I have now no less than four contraltos, in whose voices I could pick out distinctly the four registers, and in one the fifth register also. The small register is missing in four out of the five—that, no doubt, through age, as Mr. Behrke said, has disappeared; but in the majority of cases, we do distinguish a very great break indeed between the thick and thin registers. From a practical point of view it is sometimes very difficult indeed—especially with female voices—to notice any change; but as far as the great distinction between the thick and the thin is concerned, I believe in all the hundreds of voices I have ever examined, there it was. Of course the amount of training they have had before—they are not entirely untrained, and some have given some little attention to the subject before—tends to obliterate the distinction somewhat. As to the tenor voices, there is a distinction between thin and lower thin, which may be noticed perhaps more than in the female voices. I tried the experiment with a class of sixty men from eighteen to twenty only a week ago. I asked all these men to sing me first of all middle C. Then I said, sing C, E, G very softly. By that means they all sang G, some of them very indifferently indeed. I mean they all sang it who could, some could not get it at all, but all who could sing that G sang it in the thin register. I made them sing it *passim*, so that the notes were not forced from the thick register. They all took it on the register marked by the lighter shaded portion of the diagram. The contrast between the voice was very marked, and instead of the *passim* notes of the lower register the quality was very thin and small indeed, in fact, one trained tenor would be able to give a better G than the whole sixty of them. These men have only been under my care a few months. Those I have had another year I tried the same experiment with, and I found that a good many of them could sing that G fairly well, and even A and B with-

out much trouble. I was suspicious that some were using the upper than, that they were really singing in what is called the falsetto voice, instead of the lower thin register; therefore, I asked them all to define the register by the sensation. It is well known that if the lower than is employed the tone seems to come from the throat itself, but if the upper than is employed, it seems to come from some part of the roof of the mouth, though, of course, we all know it is not generated there. About half of them told me the sensation they experienced was different from the other half. Half seemed to have the tone come from the roof of the mouth, and the other half from the throat. With those who used the upper thin register the volume of tone was very much better than those who used the thin falsetto, and carried it down below its proper place. All along in my teaching I have been groping at these facts, but never had them stated clearly until I read Mr. Schuké's book. Since then I have been able, with much less trouble to myself and less fatigue to my class, to secure this singing in the thin register.

Mr. McNAUGHT.—So far as the physiological aspect of this question is concerned I should like to speak with whiggery humbleness and hated breath. My experience of it is as a practical teacher. This theory, which has been enunciated by Mr. Schuké to-day, is so familiar to me that I should as soon deny that the world goes round the sun as deny its truth. I have got used to it, and it fits in with all my experiences for many years past. It is especially useful, I may say, for training the tenor voice of choirs, and the tenors as a rule see amongst the troubles of the choir conductor. They will shout and sneer, and this theory of using the thin register and the danger of forcing up the thick register, and the fact that the thin register can be used at the upper part of men's voices, has been exceedingly useful to us in training our choirs, in fact, I might say, in a word, that this theory has reduced voice training to a science.

Dr. PHAEN.—I do not pretend to have the experience of either my friend Mr. Dunstan or Mr. McNaught, or, indeed, Mr. Curwen, but I should like to say a few words from the composer's point of view. No doubt this confusion of the register is in some degree due to the way in which composers look at the human voice in writing for it. We are all told in learning how to write a fugue that we must consider the soprano part as being to a certain extent an octave above the tenor; for instance, if the subject is announced in the soprano, you will have the very same notes sung by the tenor an octave lower, and the same thing will occur with respect to the contralto and bass voices. I cannot help thinking that this fact to some degree may help to explain the confusion into which this matter has fallen.

Dr. LAMONT BROWN.—I feel, Sir, that it is almost an impertinence for me to say anything here this evening; but as everybody may well imagine, I, from my point of view as a doctor, am able to confirm everything Mr. Behnke has said. In fact, it has been by working with him and seeing his splendid auto-laryngoscopic demonstrations, as well as by examining the larynx of others, that I have some idea of what the registers of the human voice are. It has been said that Mr. Behnke has somewhat indiscreetly exhibited his larynx, and it has been asked what good has come of it. I beg leave to ask—How were the investigations of the inventor of the laryngoscope made, by the man whom you all ought to be very proud of, whom we as doctors delight to honour—Manuel Garcia? They were by examination of his own larynx; and in his paper at the Royal Society—which has never been disputed—he taught the use of the laryngoscope. I say that an immense amount of modern teaching in singing is due to the investigations of Garcia, and that was done by auto-laryngoscopic examination. When the great Professor Coernack sought to apply this discovery of the musical professor to the healing of diseased throats, how did he carry out his work? Why he travelled through the whole of Europe and demonstrated his own larynx. What Manuel Garcia did with his paper at the Royal Society, what Coernack did for the advancement of the laryngoscope and its application to the healing of diseased throats, Behnke is now doing by his enthusiasm, by the control he has obtained over his own larynx, for all those who are teachers of music and members of choirs.

Mr. KLEIN.—In view of what Dr. Brown has said, I would like very much to say this, that as a pupil of Manuel Garcia for four years, I had the privilege of hearing from him demonstrations, oral rather than practical, of the use and value of the laryngoscope. I would, however, like to add that those demonstrations were practically useless to me until I saw Mr. Behnke and Dr. Lamont Brown's book.

The CHAIRMAN.—Before calling on Mr. Behnke to reply, I should like to say that I was very glad to hear the name of Manuel Garcia mentioned with the respect and honour that it should be by all English musicians who have trained voices. There is just one other point I may say a few words upon. I take it that this question must have a practical outcome, and the query which musicians will ask is:—Can Mr. Behnke distinctly say what is the note, or the various notes at which the breaks of the voice occur; because, if so, then we can assimilate the two registers together, and a very great deal will have been accomplished.

Mr. BROWN.—The Chairman has asked one or two questions which are very important ones. When he first

got up he said it would naturally be asked—What was the good of these investigations? It is a question which is continually asked, and I myself, enthusiastic as I am in the matter of these investigations, am always most ready to admit that if there were no practical outcome of all this, then, however interesting it may be, it would be of very little good. But, as a matter of fact, it is really of the very highest practical importance in the case of those who have at all grasped the facts which are brought out in these investigations. When I commenced teaching I found it was all guess work, I was continually in mid-air, I had nothing to stand upon; that was a most unsatisfactory state of affairs to me; and then I turned to science and commenced reading scientific books. I have no hesitation in saying that the more I read books—which, of course, were never intended for my personal use, they were intended for medical men—the more hopelessly I got into a fog. At that time the auto-laryngoscope was not to be bought. I had to make my own instruments. Now-a-days it is all plain sailing. It is very easy for any man who wishes to carry on investigations, because he can buy an instrument, and the whole process is described. It was not so in those days, and I had to find out everything for myself. I had the kerosene lamp on, just the same as you have gas in your house, and whenever I had time I turned the kerosene lamp on and commenced operating on myself, or on any other unfortunate individual that I could lay hold of. I can assure you that I would not in my work as a teacher be without the basis which I have obtained by means of my investigations on any consideration whatsoever, because I find that I have no difficulty at all, where I had the greatest difficulty in times gone by. My mode of proceeding is simply this: I sit down before my laryngoscope, and show my pupil what a good tone depends upon, and what is the position of the soft palate in the throat in the formation of a good tone. Then I produce a nasal tone and show the action of the soft palate in the nasal tone. I now ask the pupil to take my place, and to sing before the laryngoscope, as I had been singing previously. Then the pupil would see immediately where the difficulty lies, and all I have to do is to give this pupil control over his soft palate and the difficulty disappears in a very short time. So much in reply to the question of what is the good of it. One more remark in reply to an observation which fell from Mr. Dumas. He said that the registers were not always equally clear, particularly the sub-division. Of course not, and undoubtedly in many voices they are not at all clear. In fact, you cannot hear them. Then I say: It is not the teacher's object to exaggerate the registers. I always say in reply to people who ask me

the particular question, if you do not find these breaks in the voice be thankful that they are not there, because then you will not have to equalise them; do not try all you can to pull a voice to pieces, but do, on the contrary, all you can to make the voice the one great instrument the Almighty intended it to be. With regard to the exact point where the change occurs, the fact of the matter is, it is quite impossible to lay down an exact law. You cannot fix the limits of the different registers within a semitone, nor yet within a tone, very often not within a third; but, broadly speaking, you may take it that, as I have put it on the diagram, the great break between the thick and thin, or chest and falsetto takes place at *F* in the first space of the treble clef; of course when sung by a tenor it is written an octave higher, but that is the *F* he really sings. There is the great break, below that you have the thick, and above that you have the thin, and another octave higher above the same *F* you have the small. I believe that the fact of the break from the thin into the small is a soprano voice occurring exactly where the break occurs between the thick and the thin in the tenor, only an octave higher, has had more to do with mixing up the two voices—with the idea that the soprano is a reproduction of the tenor—than anything else. Then you will find if you listen to the majority of male voices, that there is a change at about *A* or *B*, between the lower thick and the upper thick. The change varies, it is a little lower in low voices, and a little higher in high voices. I find, as a rule, that a low bass changes on the *G*, from the lower into the upper thick, a bassoon on the *A*, and a tenor on the *B*. In contralto voices I find the change is very much the same. In the vast majority of cases the change takes place on *B*. Then there is another change at about *C*<sup>2</sup>, from the lower thin to the upper thin, and finally a change on *F*<sup>2</sup> from the thin into the small.

Mr. McNAUGHT.—I forgot to say just now that Mr. Dehnke has said nothing whatever about the fact of the registers overlapping; perhaps some of the audience who have not thought about the matter may think that there is an arbitrary break, but, in fact, there are some notes which exist side by side.

Mr. BREWER.—That is a very great point, and one which I have not mentioned, because it really does not come under the head of my lecture to-night. It would come under the head of how to develop or how to treat the registers. But since the matter has been mentioned, I may say that I set my face against screwing the registers up. Of course, that is, as we know, a very common thing. There are teachers who are absolutely proud of being able to extend a person's voice; it is nothing but a screwing process. It is a case of

either bend or break, and I am satisfied that is the reason why, of all the thousands of young people who go into vocal training, there are so very few, comparatively speaking, who survive the process. They simply cannot stand it. They break down before they have ever had time to come before the public. I always go on the principle of carrying each register downwards. To take one illustration, if you talk about a tenor, you may take the thick register, and screw it up to *A* or *B* flat, or whatever the case may be. He will sing those tones, and make the rafters ring, but he could no more sing those tones softly than he could fly. It is a case of forcing, and if you were to look down his throat at the time you would see that his larynx was in a state of most terrible tension. It would be all red and inflamed. If, on the other hand, you take the thin register and calibrate it, and carry it down a third, so as to give him two or three optional tones at the break, which he can sing either in the one register or in the other, you overcome the difficulty. That difficulty is even greater, I have no hesitation in saying, in the case of contraltos than in tenors. In the case of contralto voices, the break takes place at the same place, at the *F*. It is one of the commonest things in my experience that contraltos try to screw their upper thick register up to *A* or *B* flat. What is the result? The result is that, when they do change into the thin register, the contrast is so obvious that by no manner of means can you ever get over it. The consequence is that in such voices you always find a big hole. You can do what you like, but you will never fill it up. Now I, on the other hand, take the thin register and calibrate that. I commence with the thin register from *E* to *B*, and keep the pupil for months and months singing nothing but in that register. I do all I can to make that strong and bring it out. Having carried it down to begin with to *E*, I then commence to join it on to the thick, and the difficulty has disappeared. That thin register has then become very much stronger, and I have not allowed the thick register to be forced up, and the difficulty of equalising the registers does not exist.

[Mr. Otto Gumbachman proposed a vote of thanks to the Chairman, which was carried unanimously.]

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DECEMBER 8, 1925.

MAJOR GEORGE A. CRAWFORD  
IN THE CHAIR.

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THE HIGHER TRAINING OF CHURCH  
MUSICIANS AND CHOIRS.

By W. DE M. SARGISON, ORGANIST AND DIRECTOR OF THE  
CHOIR OF S. PETER'S, EATON SQUARE.

I TAKE it for granted that I am in sympathy with the object of this Association in bringing before you one phase of musical work, which is of national interest, for discussion—viz., "The higher training of church organists, choir-masters, and choirs." So large a proportion of our musical youth aspire to excel themselves in the service of the Church, that the training they receive becomes a momentous question for our future as a musical nation.

A sincere desire to emphasize the importance of this subject induces me, at the request of your Council, with all humility to bring it before you. I am most anxious not to hurt anyone's feelings. You will take what I have to say for what it is worth, and I trust discuss and turn my theories inside out, so that we may get a really valuable expression of opinion from the wisdom and experience of those here assembled, whom I have the honour to address.

To plunge then in another ren, *advancic*, progress is vital to artistic life, and "Excellence" (or more properly *Excellence*) must be the result of every true artist, were it not that in these days of keen competition stagnation is becoming almost impossible. We cannot all, however, be great geniuses, and there are many who, even if they had the talent, can never have the opportunity of rising beyond a certain level; therefore the musical culture of the nation must always be a question of degree, according to the aims, abilities, and opportunities of individuals.

I cannot but feel that our insularity has a baneful influence upon the musical growth of our young church musicians; art cannot be insular; it is broad, universal. It seems to me that we are prone to go on in a narrow groove, and are not very disposed to see what others are doing. I order specially here to those who are brought up in the country. There is

a want of breadth and comprehensiveness in the education these men receive; they aim too low, and the result is that dull routine crushes out the divine spark. The training that a student gets at a foreign Conservatoire is so comprehensive, he learns so much, he comes into contact with so many that excel in all branches of the art, that he is daily assimilating fresh knowledge and developing the powers of an artist. These privileges are not within the reach of most of our students, and the average youth who wishes to make church music his profession has only two aims in life—to be an organist and to have a degree.

Now, I venture to say that this is not enough, and that the pursuit of the quest turns out many very dull creatures, narrow-minded, with but little knowledge of, and sympathy with, the great world of art beyond their narrow ken, gradually losing interest in what they do, and so failing to interest others, and remaining always mediocre.

The causes of this result seem to me to arise—first, from youths being encouraged to make it the object of their ambition to be organists only, instead of aiming higher—to, to be artists, complete musicians in the highest sense; and second, from the want of breadth and comprehensiveness of their education.

Let us glance at the career of some country pupils of, say, cathedral organists. The pupil's musical horizon is limited to the church services, a little old world piano music (if the teacher happens to take that instrument under his patronage at all), and a very occasional concert of possibly not very high class music from some passing company of musicians. After five or six years of travelling along this level plain, he is qualified to play a service and some organ music, and is ready to fill any post that may offer; with the fountains of love for music and higher aspirations dried up in his heart from weariness of the cathedral groves, the uninteresting listless performances of the choir, the tedium of theological study; with nothing to stimulate him to put his theoretical knowledge into practice, hearing nothing that quickens his spirit to a real love of the noble art for its own sake; having no higher aim before him, from the narrow basin of his education, from death of novelty, life, companionship in art, sympathy, from want of anything to excite his ambition to rise; and from moving in a little, narrow circle, the enthusiasm he once felt is apt to sink into apathy, and he gradually resigns himself to his fate and becomes a commonplace, spiritless drudge.

The responsibility that rests with the masters in these cases is manifestly great. If they do not instil into their pupils' minds a high ambition, enlarge their views, and, by sympathy, encourage them in their arduous career; if they



have not Catholic sympathies in art, let them be ever so good as theorists, their scholarship ever so classic, that love of art which is vital will wither and die in the pupil's breast, and the higher aims and aspirations once awakened in him will become callous and fade away.

The training a man gets at a cathedral is very good in its way up to a certain point. It is an experience every church musician should have, for it is only there he can thoroughly learn his business; but the mistake is to limit the studies to the music connected with it—to stop there. I feel sure that when men are encouraged to aim higher than being merely organists, to make themselves artists, thorough musicians, when ecclesiastical studies are only *part* of the scheme of education, they are more likely to preserve their vitality, and to put out feelers into the higher realms of art in the future; perhaps, some day, blossom into conductors and composers, finding fresh fields and pastures new for themselves and their people, and to rise above the level of mediocrity.

It may be urged that youths who are cathedral pupils have no time for more than they do—all I can say is that men who have been pupils at country cathedrals have said to me, "When the cathedral service was over at four o'clock our music was over for the day, we thought no more about it." Imagine the waste of time! and the way these men have to make up!

And now with regard to University degrees. There is a great misapprehension in the minds of the general public as to the worth and importance of a degree to a church musician. It is an English superstition that a man cannot be worth much without one, and that it is a *rechet* of efficiency, exactly in the same sense as a degree in medicine. It is nothing of the sort, so the sooner this superstition is exploded the better. The degree of a physician certifies his proficiency in theoretical and practical knowledge and experience. The degree in music is, as we all know, purely theoretical, and as regards practical efficiency a man who boasts a Mus. Bsc. or Mus. Dec. may be, to use a vulgarism, "the greatest duffer out." A case in point occurs to me. A relation of mine once said to a member of a congregation, where the music was remarkable for its utter badness, "I hear the music at your church is so bad." "Oh, dear no," said the musical individual, "it is very good, it must be; why our organist is a Doctor of Music and wears his hood!"

Putting apart, is it not the case that those Englishmen who have come to the front as conductors and composers are not the men who have made an English University degree their highest aim, but men of wider culture, who have refused to put themselves into narrow tramways, but have made their studies broad, Catholic, and versatile?

Let it not be thought that I wish to disparage University degrees, or to ignore the efforts that are being made to encourage art in the examinations; but I say it is a bad thing for a man to make it his *raison d'être*, the pinnacle he never hopes to soar above. If a man, having once attained it, rests on his own, aims no higher, he has small chance of ever attaining to the higher walks of art.

It is a good omen for the future that a higher intellectual standard and a wider cultivation is now necessary to pass the arts examination; but I cannot think that a University degree is desirable for all. The necessary hard work at theory often saps the energies of men for practical work, and leaves them exhausted; the time and strength they have to give to it narrows their scope of study and gives them too little time to improve themselves in other respects. After all, it is but a somewhat one-sided view of art (though it may be a terribly heretical theory to advance), as it is proverbial that you must adopt your examiner's or professor's views and theories! And as it not to be regretted that practical efficiency is not guaranteed thereby?

Among all the men who are turned out as organists from cathedrals, academies, and so on, how few good choir trainers there are! It is said to be a rare gift—for my own part I cannot see why it need be if a man has a good training, and is blessed with a good ear and a little common-sense.

"Show me a good choir trainer," said a great church musician to me some years ago. A distinguished cathedral organist said to me last year, "We want a school for educating men as choir trainers, and I feel the want of it more and more every day." This is a gospel I have been preaching myself for years, and feel the truth of it wherever I go.

At the Royal College of Music, for instance, men are educated on the broadest possible basis in every branch of the art; but this important phase is left out, so that a man may pass through the whole course there, and turn out an accomplished practical and theoretical musician, but the principal work he will have to do if he wishes to become a good church musician he will know nothing of from what he has learnt there—viz., the training of a choir.

I have often thought that if a special department in any London Academy—the Royal College, the Royal Academy, or, perhaps, the Guildhall School in course of time—could be established, whereby special training could be given to those who wish to qualify as church musicians, it would meet a great want. If a diploma were granted from this institution, which would not only be a *certificate* of advanced theoretical knowledge, and at the same time of practical efficiency, in those branches of accomplishment required of

a good church musician, it would be a prize worth striving for, and the possession of it would be thoroughly equipped for the ever increasing demands upon their powers, owing to the growth and increasing popularity of church music.

It has struck me as being extraordinary that distinguished musicians should not realize that it is one thing to be a good organist and another to be a good choir trainer.

The special training a man gets as accompanying priest, canticle, hymns, and anthems at a cathedral or church, he does not get at the London Academy, and the training in the fulness of the art that he gets in the London Academy he loses at the country cathedral. But even at the country cathedral the student gets but very limited experience in choir training. Cathedral singing is, after all, very little more than quartet or double quartet singing, as distinguished from *chorus* singing—congregational singing is hardly taken into account—and as regards the quality and voice production of the boys, for my own part, I have but seldom heard anything passable in this respect in a country cathedral, judging by the standard of excellence that I know can be attained by boys.

Let us now turn our attention to what the qualifications for a thoroughly efficient church musician really are.

A man ought to be ambitious—art is a great and imperious mistress, she will have all or none. The devotion of a lifetime, and all the energies we possess is not too much. If it is taken up in a half-hearted negligent way, nothing great will ever be accomplished, and mediocrity is the inevitable outcome.

The first thing is the *spirit* in which the work is undertaken, and the life devoted to the shrine of art. It is not the man, or the manner, the performance, the discourse, or whatever the undertaking may be that really influences people, it is the *spirit* that underlies what is said or done, the motive that actuates that makes itself felt through all, and is the *real power*.

The artist who desires to devote the first fruits and the best of his energies to church music, feels that it is a privilege while he is working for legitimate success and advance, that his work is at the same time a benefit to mankind, and derives new strength and energy from the reflection.

The question of remuneration underlies all other considerations actually, and so perhaps it is as well to mention it here. As a rule, the pay is poor and meagrely in the extreme, and this cannot be too often said. Pay, less than a servant's or day labourer's is often offered for a good organist and choirmaster. More than this, so much more work is expected from the musician than the miserable stipend in any way warrants, that if he did not do far more

than even the clergy require of him, he would be considered inefficient, and probably be censured. The more publicly this is emphasised the better.

The increasing demand for superior men may be one means of improving matters in this respect. There is no doubt that the best qualified men will take the best places.

A man of resources can help out his income in other ways, and if a lofty motive underlies his church work it elevates at once the artist and audience, it cannot fail to meet with its sure reward. I am of opinion that the man who wishes to be a master of the craft, a complete artist, should be prepared to embody the positions of organist and choirmaster. To divide these offices seems to me a *prima facie* argument of incompetence on the part of each officer, and an element of weakness and discord. I think I am not wrong in saying that it is the rule in most cathedrals and college chapels for the organist to be choirmaster; so I think it should be always. I can only conceive of one arrangement which could work really well where two officiate, and that is where the choirmaster is supreme, and the organist either his pupil or one who acts entirely under his instructions, and carries them out to the letter.

The choirmaster-organist should have a very large discretion in the choice of music within the limits fixed by his clergy. He should show as much wisdom and tact in this respect as to make his position unassailable. It appears to me beyond question that when a man has the ability to catch a clear upon definite principles, that he is the best person to accompany them, when he can give point and emphasis to his teaching. His playing and teaching are coexistent, a definite effect is aimed at and attained, which both choir and congregation will co-operate with willingly if a man manages well.

Theological knowledge and perception is essential that his interpretation of the psalms, canticles, and songs may be appropriate, that his music may fulfil its highest function—the re-inspiring, the (so to speak) fresh revelation of the great truths of religion, which makes it come with unspendable power upon his hearers; that his choice of music, vocal and instrumental, on all occasions, may be in harmony with the Church's teaching; that the raffinade of his teaching to his choir may make them perceive and know the meaning and power of the words they sing, and so deepen the impression made upon themselves and their hearers.

As to his education, he must begin with the piano and go from that to the organ (not vice versa). Good execution and technique at the piano will put a wide field of organ music within his grasp, bring him into sympathy with the greatest composers, and be an ever new source of delight and refresh-

ment. Duet playing is very improving for sight reading and studying the time of the young player, also pianoforte trios and chamber music where possible. It is good for the mind and a useful accomplishment to acquire early the habit of committing music accurately to memory.

As an organ player, to be really artistic, he must be eclectic. The wider his scope of study the better, only he should make a stand against descending to the vulgar and trashy, while he is careful not to place himself out of tune with his audience by always flying over their heads. The attention of an audience must be awakened before they can be led to listen to thoughtful classical compositions. It requires dogged determination and hard work to master the difficulties of advanced organ music, and when this is done I submit that the chief benefit that will accrue to a good church musician will be not that he can at all times make a parade of personal display, but that the command he has acquired of the instrument makes him so free of transients at the keys, that his attention can be fixed on the choir he is conducting with his accompaniments, hold them well in hand, and make the effect of what is being performed definite, prompt, and harmonious.

The "choirmaster-organist" must be the "conductor-accompanist," and must have in himself the instinct of the conductor as well as the sensitiveness of the accompanist. The power of starting a choir well together, initiating and maintaining the correct speed, is a rare and valuable quality. There are two essentials to attain this—one, intuitive perception of what the speed should be at first sight, which may be cultivated by careful observation; the other, hands that are not glued to the keys or feet to the pedals, but ready to mark the rhythm and accent of the music as occasion may require, care being taken not to mar that smoothness of effect which is a beautiful characteristic of organ tone.

His conductor's instinct and sense of time and rhythm will be developed by conducting orchestral services and oratorios. Here his acquaintance with cathedral stores will assist him; further, he must have some knowledge of instrumentation, and this branch of study must not be neglected. An incidental study in connection with this is transposition, which should constantly be put into practice.

If he can learn some orchestral instrument, so much the better, so as to get into the band, and have some experience of being "well conducted"; it will also quicken the sense of accuracy of pitch and intonation.

The more he knows of harmony, counterpoint, orchestration, form, acoustics, history, literature, the greater interest he will feel in the upper regions of the art, though, as he is drawn higher the summits above him yet to be scaled may

seem innumerable—to some they may be. But what shall be denied to earnest work and ambition?

It is the contemplation of religious subjects that has brought out the greatest masterpieces of artists, and the greatest musical geniuses have, by their complete knowledge and control of musical ideas and forces, rendered high service to religion by their grand and immortal sacred works.

We come now to that which so many good players are deficient in, and are in consequence poor choir leaders—the art of singing. It is lamentable to go about and hear the wretched tone of men and boys, because there is no one to teach them how to open their mouths and use their voices. The plea that the material is bad will seldom hold good—the saddle should be put on the right horse. I have known the most admirable tone produced from the commonest ill-fed agricultural boys, and have in twenty years' experience as a teacher proved abundantly that the finest and most superb effects of vocalisation can be produced from common material, especially from London boys.

Of course there are difficulties, which a man who has made a study of voice production can get over with patience, such as cockyness or provocation. Incidentally, one may remark that unless the teacher's own English is above reproach, it is fatal to his ever attaining the best results from his pupils. A slight knowledge of Italian will assist the singing master in producing full round open vowels, and in forcing open those tightly closed English mouths and throats. To my mind the only possible style of singing is the old Italian, upon which I was brought up. I cannot see, however, why Englishmen, who have within them the nature and temperament of artists, should not be able to teach and learn singing as well as foreigners, if they are put on the right lines.

This review of the different demands that will be made upon a church musician is a formidable array, but those who desire to be complete artists must turn their attention to all these points. My deduction from this inference is, that it is a mistake to be too much engrossed in any particular study at first, as, for instance, theoretical study. When this is the case, the weightier matters, those qualities that will be required of a man in daily practical work, will be neglected.

It is essential to an artist to keep life, enthusiasm, and vitality about him; it is the secret of his power, and it is only by making his studies broad, varied, and interesting, that these qualities can be preserved alive in him, through all the fatiguing, deadening influence of daily drudgery in after life.

When one thinks of how short is life, and how long is art, how high, how great, one feels that it is only by exercising

the limited powers of ordinary mortals to the utmost that even an approximate mastery can be attained. The natural talent of one man is conspicuously greater than another, but every hard worker knows how far painstaking conscientious work is the secret of what is popularly taken for genius.

However plainly the church musician's hand is visible (metaphorically speaking) in the effect of the music, it takes its tone from, and is powerfully influenced by, the clergy. I feel (especially as our President is in holy orders) that I am now treading on delicate ground in speaking of the clergy. Their influence is so powerful, however, that it is impossible to avoid dealing with it in connection with our subject. We take it for granted that where good music is required, the clergy wish that the music should have free course, and do its beneficent work without let or hindrance. Here we come again to what underlies all—the spirit—the intention—the motive.

We all know how plainly the views and character of each parish priest or body of clergy may be perceived in the general tone of the services, and the attitude and demeanour of both choir and congregation, whether devotional or otherwise.

The organists, choirmasters, and choirs must feel that they have the clergy working with and for them (not against them), neither should they be appressed or unduly dominated over, provided they are duly qualified for the posts they occupy.

Where there is sympathy everything is possible; without it no good results can be attained, because there can be no heart in the work. I am sorry to say that from time to time such reports do reach me, and I feel the pity of it.

For my own part, I do not like to see a clergyman, as a rule, interfering generally in musical matters. I feel that they are going out of their own province and trespassing upon ours. If it is not their *raison d'être*, they cannot have had time for the special training we have received. It is best for each, as far as possible, to keep to his own line and his own proper work, both with the same high object in view, but harmoniously, mutually aiding and assisting one another.

If some of the younger clergy would only condescend to study the elements of singing, declamation, and elocution, and cultivate a sense of pitch, before they take upon themselves the most solemn public functions, it would be more in keeping with that spirit of reverence and humility which they preach, to say the least of it, instead of (which is far too commonly the case) being totally unprepared, and buying their experience at the expense of the congregation.

Discipline there must be, and any well-disposed artist will always bend a willing obedience to it—of course, harmonious

and create—and it is the clergyman's duty on all grounds to maintain an undiminished authority and control, which, if exercised with consideration and good feeling, is never felt to be tyrannical or unjust.

Again, here the genuine artist will assert himself, for in spite of the pressures, heart burnings, and unworthy motives that may temporarily annoy or thwart him, his power will be recognised and demanded respect; the importance and influence of his ministrations will be felt to be invaluable.

To attain the highest ends the clergy and musicians must have in view a common object—not self-glorification, but the edification of the congregation, and even higher motives.

I once served under a vicar who was supposed to be unmusical, but soon after I had got the choir into shape, he said, "My dear Ferguson, that anthem was worth ten sermons," and before he left the benches on another occasion he said, "Why, my dear Ferguson, that was worth forty sermons," and I quite agreed with him.

A church musician's life is not a bed of roses altogether, it is up hill work; but so long as he is going up hill it is well, he will get to the top some day.

Let us now turn to the choir. One of the worst things they have to contend against is the wearisomeness of routine, which has such a deadening influence on the mind and heart. Cathedral choirs feel this most where antiquated, colourless services and anthems are in vogue. My own feeling is that it has a bad moral effect upon men and boys to have to sing through a service twice a day, Sundays included. I think it is too much for human nature. The men are paid to do it, and the boys are made to do it; but they have too much of it, and the inevitable result is a careless perfunctory performance, which makes the music that is performed fall altogether short of the effect it was intended to make. I am certain that once a day, on week days, is as often throughout the year as any set of men and boys can be expected to sing with spirit, interest, and good effect.

I believe that the system of double daily service runs its own course by putting too great a strain on the performers, and that as long as it goes on, peculiar to England alone as it is, the same perfunctoriness and tameness will be felt and deplored. I always feel that whether it is a song or a service that is sung, or a piece that is played, unless it be done with the whole heart and soul it is better both for the performers and audience that it should not be done at all.

Life and interest is a special characteristic of the volunteer element, and if their enthusiastic service could be incorporated and infused into the cathedral choirs it would be a great gain.



In forming large town parish choral societies are essential. The volunteers, however well intentioned, have a habit of being always otherwise engaged just when they are wanted, and there must be *four parts* that can be reckoned upon. The spirit of individual showing off should be discouraged in every one, and the higher motive always kept to the front. Leaders are always necessary for both men and boys that are earnest, ready, always watching, and on the spot. No one can estimate the value of a good, unobtrusive hon. sec., who will work with the choir-master, help him in countless details, writing letters, setting music, seeing that everything is ready, and working up men to attend special services, and so on.

A supplementary rehearsal with a piano is often necessary for the whole choir, for correction and learning parts. It is a good plan for a clergyman to attend to assist in keeping order—of course, without interfering with the choir-master.

The principal points which must be dwelt upon at rehearsal are the starts, pitch, rhythm, accentuation, time, phrasing, breathing, marks of expression, and distinct enunciation of syllables. Nothing should be left doubtful between the organist and the choir, so that all starts are made with precision. Care should be taken not to weary the choir by overmarching them; often the salient points only can be touched upon at rehearsal. Their attention should never be allowed to flag for an instant, and conversation should be suppressed. The worst effects are produced by giving a choir more music to sing than they can rehearse, and more difficult than they can render properly. If a choir attempts what is beyond them it has bad effects in various ways—it makes them careless, it interferes with the devotion of those of the congregation who know what music ought to be, and, worst of all, it debases public taste by passing off upon a promiscuous audience flashy, imperfect performances for what is reputed to be fine singing. Aspiration and bad pronunciation should be constantly the burden of the choir-master's song at rehearsal; his aim—firmness, decision, and point in performance.

So much depends upon personal influence: a man can either lead his choir to him or have no power with them at all. Let an *elder* atone for the organist's watchword at the organ, and while it really guides the choir and congregation, the less it appears to do so the better; and never be obtrusive in accompaniment, while it should always be dramatic. Ripe experience and judgment even may err here, where the border line between the sublime and the ridiculous is often so very narrow.

In agricultural districts girls have often to be utilized instead of boys, who are always "scoring crowns," and have consequently very little voice! To go from small things to

great, on hearing the splendid effects of the female chorus at the Three Choir Festival, how often one wishes that this material, which is so generally available (as Mr. Parratt suggested at the Wakefield Church Congress), could be more utilised for festival services. This brings us to the question of congregational singing. If the women (who are by far the most constant attendants), if those who sing were encouraged to attend choir rehearsals, so as to get a knowledge of the choir-master's system of singing Psalms and hymns, they could assist in keeping the congregation generally with the choir, and, further, they could form a nucleus to reinforce the choir for a festival chorus. Congregational singing may be a distasteful subject to some musicians, but it is an integral part of the Church's system, and can be guided. With skill and care, not only very broad, grand effects can be produced in Psalm and hymn singing, but actual refinement and intelligence. When choir-master, choir, and congregation understood one another, the whole mass can be made to go fast or slow, sing *forlornly*, and suddenly *brisk*, according to the sense and spirit of the words and the will and good sense of the organist, like one great choir. When this is attained, the congregation will be led up to appreciate the singing of the trained choir in the more elaborate portions of the service, and so realize the beauty of musical worship.

The training of boys is perhaps about the most important part of a choir-master's work. I wish to mention a point in connection with choir schools. In days gone by the education, or neglect of education, of choristers by the cathedrals was a standing scandal, and there is a feeling abroad now that poor gentlemen's, particularly poor clergy-men's sons, are the best to educate at a cheap rate at a choir school.

This is, to my mind, and especially in London, a fallacy and an injustice to the boys. People often say—"I don't see why boys of a superior class should not have better voices than those of a lower." I always say—"Neither do I, except that they haven't!" The gift of music and the construction of the vocal organs is not dependant upon birth or breeding, whether high or low, and my experience is that London middle and lower class boys afford a far finer series of tones, when well trained, than the poor pale delicate creatures who offer themselves from the country (often the sons of the poorest clergy) can ever approach to. Again, if you get a choir of gentlemen boys they are supposed to go out into professions; by putting them into a choir school you are doing them an injustice, for the time that is taken up with daily services and practices, whether church or cathedral, leaves them, at fifteen or so, two or three years behind others of their own

age and position; they are, in fact, handicapped. If the school work, in addition to their choral duties, is made too hard, it is too much for the boys, and they lose heart all round. Whereas, if your boys are taken from a lower strata, you make them feel that a benefit is being conferred upon them, by giving them higher aims and objects, and by helping them to rise in life—then you gain their enthusiasm, which is so important. I speak not only from my own experience when I say that the best results have been attained by encouraging this class of boys, both while in the choir as chorists and in after life as men. The relative positions and authorities of the choirmaster and the master of the boys' school is often a vexed and vexing question. Here discord has the worst effect upon the whole choir. I know how organists have to suffer sometimes from this. If a schoolmaster is appointed who has no interest in the church music, only in the school, he will probably become jealous of the organist's power and influence, and put difficulties in his way, which has a bad effect upon the boys.

The greatest care should be taken in making these appointments. The man who has the greatest power in this world is the man who can make himself loved, and if a choir master can gain the affection and enthusiasm of his boys and men, while maintaining good discipline, he can do anything with them, they will work cordially with him.

I do not believe in corporal punishment in choirs, whatever may be done in the schools. I have had experience of lads of all sorts for many years, and have never failed to maintain perfect discipline, even under very difficult circumstances, and yet I never remember having struck or cursed a boy in my life. If you once lose your temper, of course your influence is gone for good. Harmony must prevail, and, where it is possible, all discords must be resolved; rules must not be transgressed without correction, and all become fully justified. The pervading spirit should be love of the music, its object, and of the master.

- It is disappointing to take boys too young, for their voices often go off, do not fulfil their promise, and they are so subject to childish illnesses.

I have no knowledge of the Tonic Sol-fa system, which doubtless has its merits; but the old staff notation is good enough for me.

I have said before in former papers on this and kindred subjects, that I believe the fault lies rather with the teachers than with the system. May I be allowed to quote as an instance of this branch of work, that the other day the younger boys in my choir, who have been taught on the old system, and who have many of them been less than a year with me, read through, with very few faults, the whole of

the very chromatic music of Spohr's "Last Judgment" at night.

The teacher, to be successful, must be enthusiastic about his work, and while he makes boys feel that he is their friend, they must recognise in him their master. I believe the best way of maintaining order is by appealing to that sense of honour which we are proud to boast as a national characteristic. People say that boys' singing is not emotional; I have found it otherwise. I only know that my own feelings, as a boy, were as profound (perhaps more so) as they are now. Give boys credit for all you can, descend to their level, be painstaking and patient, and you will often be surprised with the result. Careful instruction in the elements of harmony, intervals, &c., must be persevered in; the teacher must always be explicit and careful to express himself so that they understand his meaning. I have found a small hand-book useful (Hiller's), and scales and exercises must be worked into the system of teaching.

Roughly speaking, boys should not be allowed to sing from their clefs above C (third space). All false productions, nasal and throaty, &c., must be carefully reformed, shuffling and affectation avoided, intervals taken clear, vowels properly pronounced, initial and final consonants distinctly articulated, the meaning of the words and the dramatic effect of the music carefully pointed out and explained to them. Boys appreciate good, careful teaching, and one never knows how far it appeals to their better instincts, or encourages them to advance in the art in after life.

To keep them up to a high standard of excellence, boys should have at least to sing the Psalms, and have a practice once a day. The singing of the Psalms brings up the question of Gregorian and Anglican chanting. Personally I feel it to be a curious contradiction in terms, when I think of those who pride themselves on the Catholic character of their services, when they are so narrow in their views on this subject. The advocates of Gregorians only seem to prefer a rough and ready style of music, and refinement seems to be at a discount; hearty congregational singing is the professed object, and it must be conceded that for an uncultivated congregation unison singing is obviously the simplest and best. To harmonise Gregorians then appears to me to defeat this professed object, and to out-Herod Herod.

I do not concede, however, that Gregorian singing is the only possible method of getting hearty congregational effects.

The art and science of music, which has grown up and developed side by side with the Reformed Church in England, has left us a glorious heritage of chants, services, and anthems, strictly national, born and bred of the national

church, expressly written for, and well suited to, its requirements, and I fancy that the main body of Anglican Churchmen prefer them. Where it is desired to have purely congregational singing, it is easy, from the enormous mass of chants, to select those, both single and double, which have few reciting notes, which means one difficulty at least.

Time does not permit me to go fully into the discussion.

As a musician, when I listen occasionally to Gregorian Church Services, I am always struck by these grave faults. The first, owing to the frequent use of unbarred melodies in hymn tunes and chants; rhythm, time, and accents, the essentials of music, are unknown; and that the performance of communion services and anthems suffers in consequence to a painful extent. For instance, to hear an ordinary hymn sung as if it were an unbarred melody, is no time at all, is simply torture. Second, that the boys' voices are hard and unmusical. This may be owing to one of two causes, or both. The first, constant shouting upon the middle and lower registers of the voice render the upper notes shrill, hard, and flat. The second, the choir trainers commonly either ignore the elements of voice production, or have very imperfect musical perception. The third fault is one most extraordinary. How an educated clergy and a cultivated congregation can submit to the perpetual wholesale slaughter of the Queen's English under their noses, when care and reverence are supposed to be the watchword, passes my comprehension. I suppose people can get used to anything! I think it a mistake on all counts to have too constant changes of chant in the Psalms. The rendering of Anglican chants by a choir should be crisp and clear, care being taken not to jabber over the recitation parts of the verses, but to utter every syllable distinctly on the reciting note, and then to keep well together in strict time. By this means the congregation can be kept well in hand. Services are so lengthy and the strain upon the attention of a congregation so great, that it is desirable to avoid any unnecessary dawdling. The nearer the Psalms and Versicles approach to ordinary careful reading pace the better.

I am confident there is no better system of pointing content than the Cathedral Psalter, which it is in such general use.

The Psalms are the poetry of the Church, and the more closely their varying moods are entered into and their meaning reinforced by the accompanist and choir within certain limits, the better.

A congregation perceives at once whether an organist is accompanying them in a careless, deathly way, or whether he enters into the spirit of the thing. On the one hand, he must avoid the danger of caricature, and of provoking ridicule; on the other, he should endeavour to make people

feel that his accompaniment fits—brings out the sense of the words.

An old Cathedral organist laid down these rules of thumb for his pupils for Psalm accompaniment. This is a fact:—

1.—Draw Great to Principal.

2.—Swell, a *Rasch*.

3.—Choir, soft stops.

4.—Play the first three verses on the Great, the next three on the swell, the next on the choir, and then *de capo*.

In hymn singing, which is so remarkable a feature of English church music, the most impressive effects may be made or marred by the perception, tact, and skill of the organist and choirmaster.

To produce fine congregational effects, rhythm, accent, and time must pervade the whole body. The power of initiating and maintaining these rests with the organist, who, if he has it in him, and has prepared his choir at rehearsal, can take the congregation with him who, as a rule, have the instinct.

It must never be lost sight of that every hymn has its own peculiarities and requires special treatment. For instance, the massive character of "O God, our help in ages past," and the flowing melody of "Pleasant are Thy courts above" in Hymns Ancient and Modern, must be sung at very different speeds and in a totally different manner.

I must beg leave to say again here what I have said before on this subject—viz., that if an intelligent rendering of hymns is to be given, and the phrasing which the sense of the words require brought out, that staccato system of stopping at the end of each line must be given up. It is irritating and offensive to common sense to the last degree, makes people sing the most after romantic, and prevents the uneducated from realizing the force and meaning of the words.

The often quoted assertion that "Jesus lives no longer now," by a clergyman or choir, illustrates this, and countless passages can be cited.

To avoid this, a slight pause for breath can best be made, as a rule, at the end of every second line; but wherever there is to comma or stop at the end of a line where continuity is involved with the next, the choir must constantly be forbidden to take breath at the end of that line, but after any other word in it which common sense dictates. If a long note occurs in the music at the end of such a line, an *accrescendo* must be made so as to join the lines together and make sense, which the choir and congregation readily fall into.

A fault of punctuation, common in England, was once observed to me by an intelligent American—that we were in the habit of putting in a great many unnecessary commas.

This I frequently observe in hymns, tending to obscure the meaning, and is a point to which the attention of editors of any new hymnal or edition might be drawn with advantage.

The questions of breathing, phrasing, and various other details in singing more advanced music it is impossible to touch upon within the limits of this paper. One word in conclusion on the choice of music.

The Church of England choirmaster has a wide field to choose from, there is plenty of old and plenty of new, he can choose the best of each, neither should be neglected nor force the other out of the field; and if his selection tallies with and reinforces the Church's teaching in the service for the day, there is no more powerful means of conveying that teaching to the minds and hearts of the people.

He should be no less careful in his selection of organ music in voluntaries.

The charm of music is that it is so human and so divine, and is a link between the upper and lower creation. Where it is used in connection with the worship of the Creator of all it must call forth the highest emotions of men—on the principle that, what is worth doing at all is worth doing well. My plea is, that such high service requires high motives, high aims, and high cultivation; that the more complete the training of the man whose calling in life it is, the higher he will rise as an artist; and the higher his aims, the better service he will do to his country as a church musician.

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## DISCUSSION.

THE CHAIRMAN.—Ladies and Gentlemen, we have heard an extremely interesting paper and one which might furnish material for a very long discussion. I see around me many gentlemen who have had practical experience in the matter; the lecturer has referred to, and I have no doubt we shall have an extremely interesting discussion. Before calling upon them I will say one word upon the observations in the latter part of the lecture, with regard to the difficulty of dealing with hymns, where a pause at the end of a line makes nonsense, which too often happens. It occasionally happens from hymns being written by persons who have no knowledge of music. In that very case which was mentioned, "Jesus lives no longer now," as generally sung with a pause at the end of the line, it involves distinct heresy. I mentioned the matter to Miss Cox and she informed me that when she translated it from the German she had not the faintest idea of its being adapted to music—she wrote it altogether from a

poetical point of view. I suggested to her a slight re-arrangement of the first two lines, which, at any rate, removed the heresy, and she has finally adopted that as the text which she wishes to be used for the future. I merely mention that to show that in some cases these hymns have been written without any idea of musical setting, and a hymn tune being a very hard and fast sort of music, it is not always easy to deal with it, so that the sense is conveyed as it ought to be.

Mr. C. E. SARGISON.—All I have to say would be merely confirmatory of Mr. Sargison's very able discourse, and I really feel there is nothing left for me to add. I feel that he has hit a very proper chord in speaking about the limited views of some persons who are educated as organists, and who look on performance on the organ, and the daily service, antiphons, and chants as almost the finality of art, whereas, as far as musical construction and power go, it is merely at the beginning. I am very pleased, however, to have observed of late years that our young organists have not contented themselves with being merely exponents of the secrets of the organ loft; but they have travelled, like our friend Dr. Bridge, into music that does not in the least betray that the author is an organist. That is just what one wants to see. There is a certain sort of music which cathedral organists of the last century wrote very largely, and which, at the best, deserves the name of very respectable music—it certainly is that. There is a class of music abroad well known by the name of "Kagelmusical Music"; it never travels beyond the appreciation of the Church, and never has any higher aim than that of just serving the purposes of the congregation during the lifetime of the man who wrote it. One never hears of it afterwards. But one can hardly wonder at it when one looks at it; it aims, at most, as I have said, at being respectable music. With regard to the training of choirs, I have had, in my experience as an organist, a good deal to do with that, and I have found, as Mr. Sargison has, that even the poorest boys in London—and when I was at St. Clement Dane's I had nothing but the parochial children there—are susceptible of being trained to produce a very high degree of effect, so far as it goes. It is not to be set down as material that you cannot train to useful and devotional purposes. For, as I said just now, I can really only corroborate what has been so well advanced by Mr. Sargison.

Mr. HANCOCK.—I had charge for ten years of what was perhaps one of the best choirs in London, namely, the choir in Fins Street Church, and the experience I gained there was so large, that I think this assembly will not be sorry to hear some particulars of it. First of all I entirely agree with the lecturer that a conductor is absolutely necessary as well



as an organist to produce the full effect of the music. I do not believe an organist can conduct efficiently with the keys, and I, myself, have officiated as organist for years, both abroad and at home. At Farm Street my principle was absolute autocracy; implicit obedience of both singers and organist; the endeavour was to make every performance an individual one, to stamp the individuality of the conductor on each separate performance. My choir was not large—ten singers; six sopranos, three first and three second; two tenors, and two basses; but they were trained so perfectly after a few months that very few persons believed they were so small in number as they really were. As an Anglican, I opposed always the introduction of Gregorian music. I said then, as this gentleman has said to-night, that the Church of England has such a magnificent collection of music which has been the survival of the fittest, which has arisen out of its English literature, that the introduction of Gregorians was a mistake. Moreover, I thought then as an Anglican, and I think now as a Catholic, that Gregorians are best fitted for Latin, and that Anglican chants are best fitted for English. I have also opposed harmonised Gregorians. The harmony ought to come from the organist, and he ought to vary it to the best of his ability. Another thing I quite agree with is that the laity the clergy mingle with the choir the better. There is another point which Mr. Bergson did not allude to—*via deputes in choro*. I never allowed one. If a singer was unable to be present that singer forfeited the amount of the salary for that time. The consequence was that the performance was never injured by strangers coming in who know nothing about the service. Rehearsals were equally obligatory with the performances, and equally strict. The organist was equally subject to the conductor with the singers. I may tell you we ventured on the Holy Week music, six-voice masses, Mendelssohn's eight-voice motetts, Haugenmann's eight-voice masses, Beethoven in C, all Hummel; we did not do much of Haydn and Mozart; I was against that, they were too long, the words were too often repeated, and I did not consider they were devotional. Although I had a great deal of opposition at first, yet after a couple of years I believe I may say I had the whole congregation with me.

Rev. CASILLA MACDONALD.—I read a paper some years ago on this very subject, though I dare say it has been long forgotten. There was one suggestion I ventured to make, and it was that English Church composers should consider the possibilities of English worship; that is, that instead of simply concerting themselves with the perpetual iteration of single and double choruses and tunes and anthems of a certain sort, they should see whether our worship could not

develop something more like the Lutheran service of song which we get in the Passion music and the Christmas oratorios. I am sorry to say that that has never been done, but I should like to make the suggestion again. There has been a movement in that direction. It has come largely from those who have not been mentioned before to-day, but who, I venture to think, are deserving of a large amount of credit for the development of worship music—I mean our English Protestant Nonconformist brethren; because I fancy that Dr. Gounstlett and Dr. Allen did more for the development of grand congregational singing than any church organist or choirmaster or congregation it has ever been my lot to meet with. I think the same might be said of Mr. Birney at the Weigh House Chapel. They led the way in grand congregational efforts and showed us how to do it. But since that time services of song have been very plentifully produced. There is a Cornish gentleman, Mr. Child, of Looe, who has produced some services of song, and the Sunday School Institute is issuing a large number more. They are very meagre in their character, and to a musician their worth may be unconsciously little, but they seem to point to something which composers of essence, of thought, and ability might do well to take in hand. If any of them will produce one I will give him an opportunity of hearing it sung by a congregation of one thousand people, and if Mr. Simpson will come up and listen to it, I will show him that all he desiderates can be accomplished. Last night it was my privilege, after the service was finished, to invite the congregation to sing Elvey's Christmas anthem—"Arise, shine, for thy light is come." You may say it is not very difficult, but, on the other hand, it is not very easy for a congregation, and they sang it, and produced what has been called broad congregational effect with a great amount of success. It seems to me that if that sort of thing could be developed and extended we might draw congregations by music, and as the statistics recently published show that not one church in twenty has more than half the number it ought to contain in it on Sunday, it is just worthy of consideration whether, after a generation of preaching more or less bad and more or less good, we should try a generation of musical effort. The Queen's Jubilee might fitly inaugurate an effort to do what we should do—make the people musical on the only day when we have the opportunity of getting the people together, that is, on Sundays.

*MR. HANMER.*—Might I add one word on another subject which has not been mentioned to-night? That is, the subject with regard to I have seen the increased quickness with which the lectures are now being in the English Church. I went into

a church in Dover some years ago, and they were singing that most glorious "London New"; I assure you it was something like a jig. I asked the organist afterwards, a very clever man, how it was, and he said: "Sir, I cannot help it, it is the spirit of the age." We all know that in the German churches they go to the other extreme.

Mr. HOBBS.—We poor organists cannot help ourselves, we are obliged to play them at that rate because the clergy will have them so. It is quite a burlesque sometimes.

Mr. SOUTHWICK.—I hardly feel myself in accordance with what Mr. Sergeant has said, and also Mr. Stephens, as regard to the quality of voices of the lower classes, or those just above them. My experience in choir training points to this—that you have very great difficulty in training boys of that stamp. You may take all possible pains with them in church in training them to pronounce their words properly, and to sing correctly, but it seems to me when they are away from the church (and you only get them about once a week) they go to their own homes, and there the old evils are still before them, and not very much good has been effected. I must confess that I much prefer to have the sons of those who live in a higher grade of life, with whom one does not have to labour so hard to get them to sing in a proper way.

The CHAIRMAN.—I shall just make one remark before I call on the lecturer to reply, with regard to the question of University degrees. The whole origin of these is exceedingly obscure, but I believe there is very little question that it was originally a branch of mathematics, and it was strictly from the mathematical point of view, the Pythagorean point of view, that music got into the Universities. Then, somewhere about the fifteenth century, it seems to have broken off a little from the purely mathematical point of view, and then the English Universities began to give degrees in it; but all those earlier degrees, I have satisfied myself, must be looked upon as purely honorary. There was no such thing as a musical education at the University, but when a man attained certain eminence as a cathedral organist or composer, he was decorated with the degree of Bachelor or Doctor. So it went on for some little time, until the seventeenth century, and it was then that the professorships were first established, and music, in the more modern sense of the word, became something like a faculty, or began to stand on its own feet in a kind of way. But even then there was a great deal of hawking about it, for I firmly believe that to a large extent, even in modern times, the professor was simply a gentleman who received a certain fee; he looked over the exercise, as it was called, and recommended the gentleman who sent in the exercise to receive the degree, the fee being the principal part of the business. It was not, therefore,

until actually our own time that music, considered as an art, has been recognised by the Universities. There is another point—University degrees of all kinds are, to a very large extent, not practical, but theoretical. It is not quite accurate, I think, to say that a medical degree from a University is a practical one. Some Universities, no doubt, have a school of medicine, but the practical part of the education is given by the College of Physicians, or by private study. The University examines, and every University degree is merely the recognition of the attainment of a certain standard. I look upon the present movement in the Universities as of the highest possible value in this way, that before giving degrees in music they ought to insist upon a certain amount of qualification in arts. I think that is absolutely necessary, not only for the dignity of the degree, but also to place it on the same footing as the other faculties in which the art qualification is required before you proceed further. I will now call upon Mr. Sangster to reply.

Mr. Sangster.—I have to thank you very much for the kind way in which you have received my paper. There is one point in which, I am afraid, I have not made myself very clear. I did not wish to convey that the organist required a conductor; I meant to convey exactly the opposite—namely, that the organist was to acquire such power at the keys, and to have in himself that instinct of the conductor, that he would be able to hold the choir together just as well as if he were waving the stick. That is to be done by careful rehearsal and very careful preparation. As a case in point—I do not want to sound my own trumpet, but all I can say is that I have myself done this very often. For instance, Bach's "Matthew Passion," which is in eight parts, and has a most intricate organ accompaniment, which is so very independent of the voice parts, and there is very little connection with one another, that it is a very hard feat for a choir to sing without a conductor; yet, many times at my own church with a choir of some sixty voices, we have done the "Matthew Passion" so sharply and so accurately—all those double choruses without a conductor—simply by taking pains at the rehearsal beforehand, that we have never had the slightest flaw or hitch. Therefore, I venture to say it is a power which can be cultivated, and it has this great benefit, that if the performance takes place in the chancel, it does away with any motion of the hand, or anything of that sort, which so distracts the devotion of the congregation. When the thing simply flows out, with nothing to attract the eye, it has a much better effect. I am sure I am thoroughly in sympathy with the gentleman who talked about congregational music and congregational anthems. I have heard often what has been done, and I often wish I had the oppor-

tunity of doing more myself in that direction. As for composers, I do hope our English composers now, who are coming to the front, will try to devote their attention to writing really good works for performance in church. As to the lower class of boys in London, I really have hardly the face to tell you, but I can only quote from what I have done myself. I could tell you a great deal that has been said to me by the very highest authorities on the effect produced by boys of quite a low stream in London. I think the evil of their being constantly connected with low associations is, probably, to a certain extent, done away with by having a day school for the boys. It can often be managed without any great expense. That avoids their associating every day with low boys in school, which, of course, undoes the master's work. One other thing strikes me, which might be interesting to mention, about the question of musical degrees. One musician, whose name is very well known to all—the late Mr. Tuck, of Westminster Abbey—I know as a fact always refused the honorary degree of the University, because he felt he had not been through the arts examination, and, therefore, he never would accept it.

(The votes of thanks were then passed to Mr. Sergeant and the Chairman.)

JANUARY 2, 1872.

DR. STAINER

IN THE CHAIR

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### THE MUSICAL FORM OF THE HYMN TUNE.

By J. SPENCER CORNWELL.

I choose this subject, when your Secretary asked me for a Paper, because I felt it to be one of general interest. We all of us have to listen to hymn tunes, most of us have to play them, and we are compelled to think about them, whether we will or no.

Let us first remind ourselves that the hymn tune is subject to the weakness as well as the strength of all vocal music written in the stanza form, that is, which repeats the same music to successive verses of the poetry. The weakness of this form is that the composer cannot take account of the changing sentiment of the words, its strength—and for popular purposes this strength is of overwhelming importance—is that the frequently recurring tune impresses itself upon the memory, and helps to keep the words in mind. When—to Anglicize the convenient German word *Stück-compositur*—the music is “composed through,” it bends entirely to the words, and the most intimate expression becomes possible. This is no doubt the form of setting lyrics to music best calculated to please the musician, whereas the stanza form is that best calculated to please the populace. The hymn tune is even more shackled as regard to verbal expression than its secular counterpart, the ballad. A ballad singer can vary the length of notes from verse to verse, so as to improve the elocutional force of the words. Metrical irregularities can be accommodated. But in the case of the hymn tune this is not possible. The hymn tune is for the congregation, a vast unyielding mass, which would be perplexed and confounded by attempts to accommodate the music to the poetry.

I take the following as a good specimen of the old style of hymn tune. It is the work of a living composer,

Dr. Steggall, who has most successfully read himself into the spirit of the old Psalter:—



The only way in which I should venture to alter this would be by doing away with the notes of double length at the beginning of each line, by making the four lines of equal length, and by throwing the whole into quadruple time:—\*



If this is done, I do not care whether the time be written in crotchets or minims. That is merely a matter for the eye. I confess to a lingering notion that minims are more isolate than crotchets, and short-sighted people tell me they are more easy to read. A tune like the above is after the solid German type, the chord changing with the beat, the harmonies fundamental and bold, modelled upon the ancient diatonic style. For such tunes as this the German word "choral" may be justly used. It is, however, only min-

\* In order to save space I have, wherever possible, quoted the melody only.

employed in England. I met the other day with the following, described as a chorale—



Such nomenclature is outrageous. If the word is employed at all for modern music in England let it be reserved for such tunes as this, which I take from a sacred Cantata, "Nehemiah," recently composed by Mr. Josiah Booth—





A variation from the orthodox measure of common metre can be obtained by compressing the tune into triple time, as in the following, by Mr. J. Baptista Calkin—



For a hymn of superficial cast of thought, this triple time rhythm does very well.

Long metre is necessarily heavy and monotonous. Each line of words, if the tune carries a note to a syllable, and in its common time, fills four bars, so that there is no space for pause or breathing place from first to last. Congregations, however, require breathing time, and it is best to make a short pause at the end of the second line. To write a long metre tune, which is really interesting, is a difficult task: how much more then to write a double long metre. I quote the following tune, by Mr. Henry Lubin, as a successful example of D. L. M.—





All art forms have principles in common, and an interesting parallel may be drawn between a hymn tune and a novel. In a novel the suspense and excitement reach their height at the end of the second volume: the third volume is devoted to pleasurable reunions and the establishment of rest and confidence. In accordance with this principle, Mr. Lohse's dominant pedal, running through lines five and six, forms an harmonic *apex*, which sinks again to repose at the re-appearance of the first theme, three-quarters of the way through the tune.

The above tune serves also to remind us of the harmonic characteristic of modern hymn tunes. Quicker singing has worked a great change; the harmony no longer moves with the beat, it continues through two, and sometimes through four beats, and cadences between the lines are often avoided, two lines becoming one harmonic phrase. Add to this the free use of modern harmony, and we realize how widely the conception of the Psalm or hymn tune has changed.

There is a point of contact between the hymn tune and the Anglican chant. The following tune, by Sir Arthur Sullivan, has much of the style of a chant—



Several composers have adopted the reciting note as a means of rendering very long lines in hymns less wearisome. For example—



The multiplication of new metres by the poets requires an endless multiplication of new tunes. The Bristol Tune Book is a very large collection containing 594 tunes, yet the compiler told me the other day that a collection of hymns had been issued for public worship which contained fifty new metres unprovided for in his large collection. It is difficult to say where this will end.

The rhetorical balance of lines in hymn tunes is an important matter. Three-bar phrases, though they cannot always be avoided, are always unsatisfactory to the ear. In the following tune—



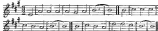
the first line occupies four bars, the second three, the third four, and the last two. The practical evil of this ill-proportioned writing is that congregations drag when there is nothing in the tune to assert its rhetorical form; on the other hand, they are quick to respond to evenly measured rhythm. I should prefer to write this tune as follows—



In the following tune, three-bar lines are, I think, unavoidable. The words are, "We speak of the meekness of the blessed." It is an eight-line tune, but I quote three lines as sufficient—



If this were made into four-bar phrases the pause would be very monotonous—



On the other hand, Dr. Dykes's tune—



should, I think, have its second and fourth lines prolonged to four bars each.

Some editors, shall we say taskmasters, of hymn tunes have a great objection to passing-notes, and strike them all out. I have no sympathy with this. Here is a tune by Dr. Steggall which I give first with the passing notes omitted, and second with them fully inserted as the composer wrote—

Other editors have an objection to unison, and I have seen the line—



Unison is certainly an allowable device in hymn tunes. Many of our leading organists would be glad to have nothing else.

The following tune is an interesting example of the treatment of trochaic eight-sevens metre in triple time—

HENRY GARNER.



The words are "Praise, my soul, the King of Heaven." The tune can be rendered in four-four time as follows—



but in this form it certainly possesses far less point, and is much less congenial to the jubilant nature of the words. It is, however, very difficult to get a large congregation to sing in triple time of this kind. As an example of injudicious use of triple time, I quote the following setting of "Abide with me"—

J. J. J. J. J. J.

H. WARD DRAKE.



The effect of the crotchets on the first beat of the bar is like that of a postman's knock, and is very disagreeable.

Composers are very apt to consider only the first verse of a hymn in writing a tune. The probability is that the more closely the phrases of a tune fit the doctrinal emphasis of the first verse, the more thoroughly will they outrage that emphasis in the subsequent verses. Thus in the following tune—

JOHN GOSWELL, M.A. No. 15.



the rhythm perfectly suits the words "Lead, kindly Light, amid th' encircling gloom," but in the second verse we have "I was not ev—er thus nor prayed that Thou."

Many composers have made lavish use of chromatic harmony in their tunes. There can be no doubt, however, that this is usually out of place, and that the true style is diatonic. Reliance should be placed upon broad effects rather than upon prettiness. There is, I am aware, some ground for the *à propos* argument. Hymns of the period are retrospective and dreary. It has been said that, whereas Bunyan's Pilgrim shook off his burden with a vigorous effort, and saw it no more, the modern pilgrim sits down, takes off his burden, and examines its contents one by one with melancholy interest. Hymns of this kind naturally invite weak and somewhat muddled tunes. Composers are justified in making this resort when they are accused of not writing better tunes.

The possibilities of harmonic sequence, or thematic development in a hymn tune are exceedingly small. Anything that can give unity to a tune is pleasing to the musical ear. Now and then a hymn may be found like "Winter mounth o'er the land," where the last verse changes suddenly from lamentation to rejoicing. This may be emphasised by a change to the tonic major. In the following tune, by Dr. Gounchett, we have something like thematic treatment: the subject, one bar in length, is started, worked at various intervals, and towards the end we have something like its inversion—

1 2 3 4 5 6.







The style of harmony is congenial to the period to which the tune belongs. There are no unexpected second inversions, and we have the suspended fourth in the cadence. I am aware that from the earliest printed records of these tunes editors have been accustomed to reharmonise them, but this reharmonising ought always to be done in the historical spirit of the tune, and, as alterations are in all cases annoying to singers, as few as possible should be made. In the "Hymnary" I find the transition made in a weaker way than in the original model—



In the "Anglican Tune Book," edited by Dr. E. G. Monk, the effect of ruggedness is certainly obtained by this string of root positions, but I fail to see the justification for the change—



In other arrangements I find the following variations—





" *London Tune Book* "" *London Tune Book* "*Hammatt's Church Psalter*" *Wesleyan Tune Book* "" *New Mass Hymnal* "

## "Breathless Turn Back."



## "Holy Year"



## "H. A. &amp; M."



## De Haas



I leave you to make your own comments on these changes. I have passed over many minor variations, as matters of taste. What I protest against is the principle that it is an editor's duty to impress his individuality upon every old tune. This principle is a somewhat dangerous one. The composers of *Winchester Old*, and the *Old Hundred* etc., are not in a position to complain of these outrages upon their work, but when the process is applied to the tunes of living composers the unfairness of the result is manifest. For example, I found lately in an American tune book the following desecration of Sullivan's tune to "Onward! Christian

soldiers," by an editor who rejoices in the name of Hodgson—



It remains only to speak of adaptations from secular sources. It is held by some that these are in every case inadmissible. With this I can hardly agree. Music is itself in neither secular nor sacred, and each piece must be judged upon its merits. Where there are living secular associations to a tune, it cannot of course be employed in worship. Let us take as an example the adaptation from Mendelssohn's *Festmarsch*, which we sing so commonly to "Hark! the herald-angel." This is a song in honour of the inventor of printing, and at the point where we sing "Hark! the herald-angel sing," the original sentiment is "Gutenberg der grosser Mann." The change of sentiment is striking and bold, yet who would object to it? Many tunes written for hymns are distressingly secular, while we have cases in which music, originally designed to express non-religious sentiment, is admirably adapted for hymns of worship.

#### DISCUSSION.

Major CAWCOCK.—I have listened with very great satisfaction to the paper we have heard to-night, and I think that what Mr. CORWEN has said will command general approbation. I will only make a few passing remarks on one or two points. With regard to the older type of hymn tunes the difficulty of the recurrence of the same melody in successive stanzas was got over to a considerable extent by its not being hampered by bars. All the old tunes of the latter part of the sixteenth century were written in staves, not in bars. Composers wrote simply in duplo or triplo time as the case might be, and they lengthened the notes just as they pleased in order to produce variety, or to give a greater amount of expression. With regard to the *unithree* at the commencement of the first strain, which was commonly used up to the present century, I think that was employed by our predecessors frequently for the purpose of getting a good hold of the chord when they started. With regard to the variation of harmonies, it must be remembered that nearly all the old types of hymn tunes had no harmonies at all, they were all intended for unison singing; and if you look at the earliest editions of the English Psalter you find merely the melody and nothing else. The harmonies were added at a later period, and in fact in the successive editions of that Psalter, the standard editions, the melodies only were given. The harmonised editions seem to me to have been private ventures which were seldom used, except by persons at home—such as Allsup's and Estey's; they were written, not in simple counterpoint, but in several cases in rather

complicated harmonies. In Allison's, I think you will find that the four parts are printed in such a way that they are opposed to each other crossways to be sung round a table: Kate's was not, but no congregation could sing the harmonies in Kate's as they are written. They are intended for better trained musicians than you will find in a congregation. I may say, therefore, that with regard to the harmonies, my impression is that the harmonies were varied from time to time at the discretion of the organist, while the congregation simply sang the melody in unison, and that, therefore, it is not altogether out of keeping for any musician of the present time to harmonize these tunes as he thinks best, provided that he does it in proper conformity to the spirit of the tune, and does not put exceedingly modern harmonies into a melody the character of which is of the sixteenth century. With regard to the variety of metres, we in England until very recently had a very small variety, because there were no hymns sung until about the beginning of the last century, and they did not come into use in the Church of England until much later. The singing was entirely confined to the Psalm versicles, the old version first of Sternhold and Hopkins, and then Tate and Brady. Old Sternhold wrote his Psalms for the express purpose of supplying sacred ballads in place of the profane ones in use at the time, and had no particular notion of their being sung in church specially. Therefore, they were written in the old ballad metre, the Chevy Chase metre, and were sung in that sort of manner. For a very long time there was very little variety in the metres beyond the common, long, short, and their doubles. In modern times of course there has been much greater variety, and it is perfectly true that if you were to take a hymn book now, and have to set melodies to it, you would experience great difficulty in finding ready made tunes to fit a great many of the new metres. In France and Germany a great variety of metres existed from the earliest period. Clément Marot was a great master of metre. He was the founder of the more modern school of French lyric poetry, and he used a great variety of metres. In Germany they did so too, and sometimes also you have metres not only very difficult to deal with in any way, but exceedingly difficult to adapt. I will take one of the commonest German chorales, "Ein feste Burg," that well-known tune of Luther's. I do not think you ever see that tune correctly given in any English hymn book, for the very simple reason that the fifth line of it consists of five syllables in the original, and for the exigencies of our metre that five is always turned into a line of six syllables. It is one of the most difficult hymns to write an English version of which will fit the English metre exactly. You find in the

French tunes a great variety, and also in the German, but in these cases the tune was nearly always written at the same time for the hymn, and in ninety-nine cases out of a hundred the union of hymn and tune as produced at the time remained unbroken, and that has been a very great advantage in many ways. In place of having the same hymn set to a very different kind of tune, and being altered perpetually, in Germany with very few exceptions the tunes and hymns remained united as they were from the beginning, but the harmonies were frequently changed, and no one did more in that way than Bach himself. I perfectly coincide with what Mr. Curwen said about hymns derived from secular sources, that every case must be judged upon its own merits. It is a very bad thing, to my notion, to adapt a secular tune which at once recalls something totally different from the words with which it is associated, or to which in itself it is not suitable. For instance, some time ago our friend Dr. Monk mentioned that there was a tune which was an adaptation of the first chorus in Weber's "Oberon," "Light as fairy foot can fall," one could recognise it immediately, and what could be more incongruous than a thing of that kind? I may mention that many of our earliest tunes, and some of the finest, and many of the German chorales or hymn tunes of Luther's time were of secular origin. Several of them were Flemish, for it was in Holland that some of the earliest books of the kind were published. In one of them that I have seen there was at the head of each tune the first line of the secular words. Some of you perhaps would hardly imagine it, but I may tell you that a portion of the Old Hundredth is of secular origin, but so it is, and so with many others; but all secular flavour has completely passed out of them long ago, and besides, at that time, there was much less distinction in character between secular and sacred productions than there is now.

Mr. SAMPSON.—I should like to say one word on the question of adaptation from secular sources. Mr. Curwen seems to think that no tune should be adapted from secular sources if it is likely to be known. Then it seems to me that it would be always dangerous, for, in a large congregation, the source from which it is taken may be known to some and unknown to others. But there is one thing more serious in the matter. So far as I have knowledge of tunes adapted from secular origin, the idea of the composer has always been more or less changed in order to make it fit the hymn, and, therefore, they all seem to me to be unsuitable. With regard to passing notes, there are good passing notes and bad, but, as a rule, I think they tend to weaken a tune. One word with regard to worked out themes. I think the example given to us is one I can

scarcely speak of as a worked out theme, it is rather that the original theme is repeated in a variety of forms with different harmonies.

Mr. F. G. Rowlands.—The only claim that I can have to say a word on this subject is that I have been for fifteen years organist in a Nonconformist church, where the hymn tune is the staple commodity. Mr. Curwen has referred to the long note at the beginning of a tune as giving a sort of grasp of the note, but my experience is, that if you give that long note, people have the idea that that is to be the speed of the tune. Dr. Staggell, my old and respected master, was very particular about the long notes. I remember perfectly well when I spoke to him about it on his compiling some edition of his book, he was very particular about these long notes.

The CHAIRMAN.—He was in favour of them?

Mr. Rowlands.—Decidedly, and he writes all his tunes in that way. I asked him about it once, but he so strongly declared it was the right thing, that I have ever afterwards in playing his tunes kept to his wishes, but I am quite convinced that it is a mistake. Sir Arthur Sullivan does away with the double bar, and makes a thick line down, which I think is an improvement. In some of the tunes by Dr. Hopkins, instead of writing out the note the full length, it is written as a dotted main, and then a crotchet rest is put so as to take breath at the end of that note, and that tends to prevent the dragging. With regard to triple time, my experience is this, that it is much more uncongregational than quadruple or simple duple time. I have found that with such a tune as "Malvern," the congregation will try and throw the triple time into quadruple time. With regard to modern arrangements, I find that the majority of strangers are men who have excellent singers in their choir; they have good basses, and they write low bass parts. I think that is a great mistake, because the sort of basses we ordinarily get are not particularly good in the low register, and it drags the tune down very much to get a continuance of a low bass. Another point I should like to have some light upon is—when a minor tune is written, the Acce always finishes with a major cadence. In this modern book, by Dr. Hopkins, in every instance the major cadence is given. With regard to the secular source, there is one further instance in the first of Mendelssohn's *Lieder*—"The brightest and best of the sons of the morning"—I think it is, and there are little bits of Beethoven's symphonies or quartets. If the congregation hear that their thoughts naturally wander off to St. James's Hall. I only heard the other day an organist, a man who is known possibly in this room, who actually played as a voluntary the Sextet from Sullivan's "Patience." If we begin

with that sort of thing, one never knows when it is going to be stopped. I think it is better to keep secular melodies out altogether.

**THE CHURCHMAN.**—I am sure we are all very much indebted to Mr. Curwen for his excellent paper, and especially for giving us an excellent text for discussion. To everyone hymn tunes are a matter of very great interest in one way or another. We get enormous congregations in St. Paul's on Sunday evenings, and although I do not always select the hymns, I do sometimes; sometimes they are selected by the Canon in residence. With regard to dragging and pausing at the end of the line, it is a very difficult question. My own impression is, that if I had a small church and congregation, I should go very nearly in strict time, but this is absolutely impossible in a very large congregation. In cases of large congregations I strongly recommend the German system of making a slight pause at the end of the line. As regards the word "chorale," it is one of the many words in music which is surrounded with great obscurity. It is something like the word "band" for an orchestra, which puzzled Sir George Grove. The word "chorale," I fancy, you find in contemporaneous editions of German music, called the "chant chorale," as if it was meant to indicate the use of chorale singing as being different if sung accompanied by instruments in secular fashion; but it is a subject quite worth looking into. The treatment of irregular metres is a very serious thing. If poets will be very irregular in their metres I am afraid they must be content to be shut out of churches. People do not always distinguish between poetry and hymns. We are very glad, of course, to get a poet to write hymns; but if he writes hymns, he must write hymns and not poetry. The sudden interchange of Iambics to Trochees, in order to give variety to poetry, becomes a serious matter to the man who has to set a tune to it. It was refreshing to hear Mr. Curwen make such a bold attack on modern hymn tunes; I was quite prepared to hear an explosion on the subject. The fact of the matter is, that a very large number of them are very weak and sentimental; but on behalf of composers, and being one of the humble scribblers of tunes myself occasionally, I must say that tune writers are very much at the mercy of the writers of words. If you give a man a stupid, sentimental subject, it is impossible that he can sit down and rise to the occasion, and turn out a tune of strength and dignity. It is a very difficult thing to write a good hymn tune. I have had many thousands pass through my hands when I worked with Dr. Monk and the late Dr. Dykes in the revision of *Hymns Ancient and Modern*. We worked very hard, and it gave me a great insight into hymn



tunes. I think very few editors can tell, sitting in their room, or even playing it on the pianoforte, what will be the success of a tune. I have long given up any hopes of being able to decide it. It is like the old Latin proverb—*scilicet amissando*. You must put it into the mouth of the people, and see if it answers when it is used—there is another test. With regard to the group of three bars, I think Mr. Carwen will agree with me that the question is, do the number of bars occur in rhythmical succession? If so, they are right. For instance, four groups of three bars is only a higher order of compound rhythm. There may either be four groups of three bars each, or you may have four groups of five or four, or eight or seven, any of these you may make rhythmical. The only thing is that the form of the tune should be understood by the people who are playing it and singing it. As regards passing notes, I think, although I am a great radical in some things, I am very conservative in others, and I am often very sorry to find the old notes and twists that my mother used to sing to me are turned out of such tunes as "Rockingham" and "Watcham." When we have them in St. Paul's, I hear a number of the congregation putting them in just as they used to do in old days. As regards giving new the old form of old tunes, that is a question that arises in every editor of a hymn book, and the valuable remarks of Major Crawford have interested me very much. As to getting the original harmonies, you cannot do it—it is impossible. You may have any authorities you like about restoring the old form, but if you go to your library and take down Este, Sternhelt, and Hopkins and others, and put them on the table before you, you will see it is an impossibility. Every now and then you will find a repeat, without rhyme or reason, and sometimes a syncopated note stuck in which would be quite impracticable at the present day, so that if you wished to return to primitive simplicity, and to reproduce it, you cannot. Even a tune like "St. David's," in the original form, I think, has a syncopated note right in the middle of the second line. If that were introduced amongst congregations it would be a very difficult thing to sing. As regards "Hack, the herald angel sing," of Mendelssohn, I think we all owe a great debt to Mr. Cummings for having introduced that as a hymn tune. It is a particularly fine tune, but I have always been sorry to find they have altered Mendelssohn's rhythm.

MR. GILBERT.—It is entered in the Church hymn book.

THE CHAIRMAN.—I am very glad to hear it. As regards secular tunes, there are some one would be very sorry to lose; for instance, that magnificent tune of Haydn's, the Austrian hymn, which is taken out of a quartet. Then there is another very well-known tune, by Bach, the origin of which

is a secular melody by Hasler, and Bach, who was much nearer the time of the composition, must have known it was a secular tune. I cannot quite agree with my brother organist about tunes in triple time not being congregational; I must say, if it is so, it is partly because they are taken too fast. I think all our hymn singing is much too fast. The Amen to minor tunes has always been a sore point with me. I do not think at all it is the right thing in "Hymns Ancient and Modern." I do not think you can get a plagal cadence fairly after a minor tune.

Major Curwen.—Does not Bach sometimes use the major?

The Chairman.—He does, but he does not put on an extra Amen. If we were allowed to stop with the end of the tune in minor tunes the difficulty would disappear. I quite think that is a question which should be attended to, to ascertain what is the most proper cadence for the Amen for a tune that ends in the minor. I must say I have not formed an opinion upon it. In many cases I would rather leave it out. Congregations are very troublesome with regard to hymn singing, as a rule. If they see anybody come into the church with surplices on they immediately stop and do nothing, and if you get them to sing it is very unsatisfactory, and they will not sing the melody—that you may take for granted. I have sat myself about in different parts of St. Paul's, when my very able colleague, Dr. Martin, has been playing, and I find that people will not sing the melody, they will sing in harmony, if they know it, and if not, they sing in thirds and fourths just as it suits their fancy, and will shout as loud as they can if they are making harmony, because they feel proud of it. It is a fact that we cannot get English people to sing melodies. Unison singing, of course, is not adapted for the human voice; what is very comfortable for a bass is exceedingly uncomfortable for a tenor, and what is comfortable for a tenor is rather high for a bass; and so with ladies' voices, what one lady can sing with perfect ease, a mezzo-soprano voice finds a difficulty in. In conclusion, I hope you will join me in passing a very hearty vote of thanks to Miss Curwen.

Mr. Curwen.—I do not think that there are any points that I have to reply upon, but I am very glad to have initiated an interchange of opinion, which, I am sure, will be very useful when published in the Transactions. I am much obliged to you for your patience, and I have to thank my friend, Mr. Gilbert, for coming to play the illustrations.

Mr. C. H. CHALLIS then exhibited a model, and explained the operation of the Dulciphone, an invention for modifying the tone of a pianoforte during the practice of technical exercises. It consisted of a long strip of felt, which, by

pulling a stop, was brought against the wires immediately under the hammers. By its use, not only was any annoyance to neighbours, or even the performer himself, from the repetition of scales and other technical exercises avoided, but it also prevented the deterioration of the instrument by constant wearing of the hammers in any particular portion of the instrument.

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Dr. W. H. MONK  
IN THE CHAIR.

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**ON THE TREATMENT OF ANCIENT ECCLESIASTICAL MELODIES IN MODERN INSTRUMENTAL COMPOSITION.**

By CHARLES WILLIAM PRAGER, MUS. DOCT., CHAIRMAN, AND HON. MUS. DOCT. UNIVERSITY OF TRINITY COLLEGE, TORONTO.

Mrs. CHURMAN, LADIES, AND GENTLEMEN,

A few remarks of an explanatory nature are necessary by way of introduction to the subject of the present paper. The term "Ancient Ecclesiastical Melody" must be defined; and certain limits should be assigned to the somewhat broad idea conveyed to the mind by the use of the words "Modern Instrumental Composition."

In the first place, it will be as well for us not to be bound down to mean any definite period of time by using the word "Ancient," nor to exclusively apply the adjective "Ecclesiastical" to any one religious source in particular. Hence, an "Ancient Ecclesiastical Melody" may be used to mean a succession of musical sounds not put together recently, but which has existed in some form or other—traditional or otherwise—for several generations, and has, during that time, acquired a certain association in the minds of its hearers, either with a particular set of words invariably sung to it as an act of worship, or with some particular doctrine, or season of the year especially set apart for the prominent teaching of that doctrine.

In the second place, it will be inconvenient to restrict the use of the term "Modern" to merely the style or manner of the present day. It will be better if the expression "Modern Instrumental Composition" be taken to mean any artistic musical form, historically posterior to the date of the first known appearance of the Ancient Ecclesiastical Melody therein treated.

So that, briefly, what I desire to bring under your notice is this: How certain melodies originally intended for vocal use in religious worship have been, or can be, employed as thematic material in compositions intended for instruments

only, for use in the chamber and concert-room as well as in the religious building.

Manifestly, such a subject as this covers an immense deal of ground, and would require volumes, rather than one single paper, to do anything like justice to it. Suffer me, then, to begin by making these two assumptions:—

*First.* That little need be said concerning the necessity or the desirability of treating such old material in the manner I have described. It must be admitted that a very strong, close, and intimate connection has existed in all times and in all places between the religious music of a nation and the daily life, thought, and feeling of its people. History again has set its mark upon this kind of music, often in an unmistakable way; there being no difficulty, for instance, in distinguishing a Puritan Psalm tune from a Monastic Hymn melody of the Middle Ages. Accordingly, an old religious tune possessing anything like a clearly defined historical character will always be of the greatest use to a composer, whenever he finds it necessary or desirable to recall vividly to the mind in the course of an overture, symphony, or other orchestral piece the general surroundings of the period associated with the subject of his work.

*Second.* I assume that it would be idle for me to call your attention this afternoon to what you have been observing all your lives—viz., the prolific use made by most great composers of those religious melodies commonly known as Church in their works for orchestra, for organ, and even for the pianoforte.

I am well aware that the ground thus cleared by these assumptions can be said to be fairly covered by the title I have given this paper; but I feel, of course, that this is neither the time nor the place for discussing well-known matters which may well be dismissed to the lecture-room of a musical college or academy. It may be said, however, that I have no right to give a comprehensive title to a paper dealing with a somewhat narrow subject. This objection might carry weight, if every wide field of artistic labour possessed no neglected corners. I venture to think that although most of the field covered by the title of this paper is already "white unto harvest" in the ripe productions of great and famous composers, certain less favoured spots are at present barren and unfruitful. I may be but trying to remove a few of the thorns and briars which still encumber some of the "stony places" even whilst the "good ground" is already yielding its "hundredfold," but I desire my neglected corner to be included as a real part of a great field of musical labour; and so I choose a comprehensive title for describing what is comparatively but a narrow and confined subject.

It is now time to come into closer quarters with this subject, and to speak of our musical heritage from the Medieval Church. But here, again, I do not wish to take up your valuable time by going into well-known details of musical archaeology. All this kind of information has already been most ably given in many another place, by far wiser and more experienced workers than myself, notably in the writings of a prominent and distinguished member of this Association—the Rev. Thomas Holmes, M.A., whose “*Hyemal Noted*” may be safely accepted as a collection of ancient ecclesiastical melodies, brought together with great care and assiduous attention—the musical outcome, in fact, of the religious life and feeling of a particular age. Here we have, at any rate, musical subject matter, closely connected with the days of romance and chivalry—a period of history whose pages are dear to every true musician, poet, dramatist, and painter. Here are melodies which were not merely entwined about the religious dogmatism of the Middle Ages, but were also inseparably associated with those particular ecclesiastical seasons of the year when the leading doctrines of Christianity were more especially brought under the immediate notice of the faithful.

It may be urged that all this is very well, but that such melodies as those to be found in Mr. Holmes's book are now happily obsolete, buried in the oblivion and dust of past ages, to be seen only in the glass cases of a modern museum, or to be pointed at with the finger of scorn by the intelligent modern vergir who may happen to exhibit to a thoughtless holiday party the treasures of an ancient Cathedral, chapter house, or library. Nay, more, I may be told even by the learned Cathedral organist himself that the totality of such melodies is vague; that they are constructed upon old modes or scales long forgotten, and never likely to again become popular; that their rhythm is as vague—perhaps even more irregular and uncertain—than their tonality, and that therefore they are altogether useless and as unworthy as they are unfit for any modern treatment, save, indeed, that of an unconscious push into the ancient waste-paper basket. It is, of course, easy to raise objections of this kind, which may be at once cheap and effective where the unthinking are concerned, but every earnest art-lover who realises that in the highest sense music is unlettered—i.e., unbound by any chains which would tie it down to any one people, period, or tonality—must feel that any fragment of antiquity which can, even for a moment, relieve the gorgeous chromaticisms of to-day by the diatonic severity of the past, is at least deserving of notice.

With respect to the charge of vague tonality, so often brought against old melodies, it may fairly be asked on the

other side, in all modern music to be fashioned in one groove, with all its melodies woven from some one particular thread of tones and semitones—with all its harmonies duly catalogued and classified into trimly built chords, to be regarded from a business point of view as so much merchandise to be traded with? Because, if so, we must at once close our eyes to all national or other melodies which may rebel more or less against the tyranny of the tonic and dominant rule of the orthodox modern scale. How many of these characteristic melodies give us pleasure by the very quaintness, freshness, and spontaneity of their tonal construction—how glad we all are to find a melody which is a little “out of the usual run,” how we admire the manner of Chopin, Dvořák, and other writers who bring their national individuality into their song. These melodies are not regarded as unpopular, unpleasant, or unintelligible to a modern ear, because, as a rule, we always hear them well performed; played too on good instruments, and sung by well-trained voices. Ancient ecclesiastical melodies, on the other hand, are seldom presented to the modern ear through the medium of a good and effective performance. But too often we hear them howled and growled by a rough, untutored choir of men and boys—yes, and of priests too, who would apparently seem to delight in sounds hideous and barbaric enough for the religious rites of any congregation of Aborigines on Greenland’s icy mountains, or India’s coral strand. Under such conditions, plain-song melodies are indeed dreadful, but no, rarely, would be any other melodies sung in so-called unison, voices which, however, agreeeth not with itself, nor by anything less than a sacrifice with the accompanying organ. To be just to the old church modes, let all conscientious objectors to their tonality say the next time they hear Madame Adeline Patti sing “There was a King once in Thule,” or Gounod’s “Faust,” that it is hideous—that they do not like the March to Calvary in “The Redemption,” and that they regard certain portions of Sir Arthur Sullivan’s “Golden Legend” as an outrage upon a modern musical ear.

Then, again, who can say that the tunes in the “Hymnal Noted” are unpopular, obsolete, unknown in the present day, when several of them are to be found in well-nigh every modern collection of hymn tunes used by every sect and denomination of worshippers? Who can say that they are unintelligible to the modern ear, or do not appeal to modern sympathy when one has heard them whistled by the very street boys of Shoreditch, St. Luke’s, and other districts in the far east of this great city?

Are we, English organists, English composers, to stand by and indifferently watch the efforts of German musicians

who have for the last three centuries elaborated, glorified, and popularised their Ancient Chorals? Are we to report foreign Ecclesiastical Melodies into our instrumental works when we require subject matter of this kind, or are we to draw from our own treasures of sacred song, from the illustrated remains of Old Sarum, York, Hereford, and other places, which have been made to yield up their long-forgotten minstrelsy, and to become again, wherever they have had a chance of being fairly heard, the real living voice of the people? Surely, before we seek to make any use of our heritage from the Mediæval Church, we should at least enquire what it is.

Speaking roughly, it may be said to consist of three distinct divisions:—

1. Chants and Responses.
2. Tunes composed for Metrical Hymns.
3. Music of a more or less traditional nature sung to different portions of the Office for Holy Communion, and to the Te Deum.

I am quite sure it would be entirely unnecessary for me to say anything about the possible treatment of a Gregorian Chant Theme in any kind of composition, instrumental or otherwise, after the exhaustive researches of Sir George Grove, who, in his articles on the "*History of a Musical Phrase*," now appearing in the *Musical World*, is showing us how the intonation common to the 1st and 8th tones—



is perpetually cropping up in the works of composers of all schools and periods, often in further passages where we have been unconscious almost of its existence.

My time being so limited to-day, I propose to speak merely of possible instrumental treatment of the second of the three divisions just named—the Hymn Tunes; although I cannot, in passing, refrain from just mentioning Rheinberger's masterly treatment of the 8th Gregorian Tone in his Pastoral or 4th Organ Sonata, and of Tonus Peregrinus in his 4th Sonata in A minor for the same instrument; nor, before I leave the third division, should I forget John Sebastian Bach's interesting Organ Counterpoint to the whole of the melody of what is known as the "*Ambrosian Te Deum*," published as No. 95 in Book VI. of the Peters' Edition of Bach's Organ Works. I prefer to deal only with the treatment of hymn tunes to-day, for at least two reasons:—

First, Because, by their having been originally intended as musical settings to the verses of Metrical Hymns, these approximate more closely to modern notions of rhythm.



*Second.* Because, from traditional association with words commemorative of the sacred events peculiarly assigned to distinct seasons of the year, plain-song melodies have acquired an interest and doctrinal significance only to be paralleled by the same traditional association with words which has long been considered one of the chief distinguishing features of the German Choral.

It may be asked—"How does a plain-song hymn melody differ rhythmically from a modern hymn tune?" Chiefly in this respect, that whereas the modern hymn tune provides either one whole note or, at the most, two half notes for each syllable of the words, the plain-song melody has often many whole notes, which may again be as frequently interspersed with shorter notes, all sung to but one syllable of the words. Such a group of notes was known as a *Ligature* or *Peristasis*, and generally made its appearance in the tune coincidently with the penultimate or anti-penultimate syllable of any line of the poetry in a manner somewhat suggestive of the cadence in a modern instrumental concerto. But if sung at the end of a plain-song melody to a more or less indefinite vowel sound disconnected entirely with the verbal text, such an irregular group of notes was known as a *Prestema*.

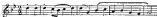
It is, of course, distressing to an antiquarian ear to have these ancient cadences or ligatures curtailed in any way, or their notes huddled closely together in some modern rhythmical form when a plain-song melody is actually sung to the words of its ancient hymn; but for instrumental treatment, where contrapuntal exigencies have to be considered, general expediency, united to the interest gained by superposed external surroundings, must be pleaded as an excuse for slight rhythmical alterations.

Thus, the well-known ancient melody *Urbs Beata*, which has two whole notes for the second unaccented syllable of its first line of words—



Urbs Be - a - ta, . . Ha - bi - ta - ta,

would lose much of its inherent stateliness were these two whole notes sung hurriedly as half notes; but such rhythmical alteration does not detract from the native majesty of the melody when it is used as an instrumental fugel subject—



My first illustration will, I hope, atone somewhat for any violence offered by this rhythmical alteration to the spirit of

antiquarianism by the interest of the contrapuntal surroundings. The following extract is, in fact, part of the straths of an organ fugue, in which the subject you have just heard is given by augmentation to the solo tuba, whilst against this main theme the other parts—played by the great and pedal organs—are perpetually thrusting portions of the same fugal subject in notes of the original length. On the present occasion the violoncello will play the part intended for the solo tuba of the organ.

Illustration I.\* *Pagal Treatment of Urbs Beata Hierusalem.*

It will have been noted by every careful observer that the melody *Urbs Beata* is written in the first of the Ecclesiastical modes—that known as *Dorian*—in which the seventh degree lies at the interval of a whole tone below the upper final, and cannot therefore be used with any sense of propriety as a leading note. Possibly much of the hideousness associated in the popular mind with Gregorian music has taken its rise in the unthoughtful use of this uncompromising and highly characteristic seventh degree of the *Dorian* mode as the minor third of a would-be-if-I-could dominant chord. I need only refer you to the harmonisation of the concluding strain of the Advent melody, *O come, O come, Emmanuel*, as it appears in that most popular book "*Hymns Ancient and Modern*." Those of you who have tried to teach untrained boys to sing a minor third in the last chord but one will readily understand what I mean—



Indeed, in some Nonconformist collections of hymn tunes I have seen a ♯ prefixed to the unoffending *D* with the most refreshing disregard of musical tenacity; but surely if the accompanying harmonies were arranged somewhat after the fashion and that of the harmonisation of *Urbs Beata* in "*Hymns Ancient and Modern*," there would

\* See "*Urbs Beata Hierusalem*," a Prelude for the organ, by Charles W. Frank, pp. 4, 5, London Music Publishing Company, 22 Great Marlborough Street, W.

be no difficulty about getting the very characteristic D♭ song—



Now, I venture to think, the modern playful cadence added to the sustained final note sufficiently satisfies a reasonable nineteenth century musical ear; and a somewhat similar treatment of the seventh degree of the Dorian mode you will have noticed in the illustrative *fugal treatment of Uke Beate* just played to you.

Ancient plain-song melodies are certainly not without their poetical associations—a fact I have already hinted at—and one which may to some extent be pleaded in defence of such modes of treatment as I am suggesting to-day. They come to us as the products of an age which has bequeathed our priceless treasures of architectural art—those grand Cathedrals and ancient churches—those many (and) ruins of abbeys which give such an interest and impart so much picturesque beauty to our native English scenery. Most of the better known ancient melodies in use at the present day—namely, *Uke Beate* and *Te Aetate Irenaeum*—have been handed down to us in the pages of the *Salisbury Hymnal*. As an unworthy native of a city so rich in its ancient ecclesiastical and musical associations as Salisbury or Sarum, I may be pardoned perhaps for dwelling a little upon the poetical surroundings of ancient musical themes, which may be somewhat uninteresting to others who do not share with me the pride of birthplace. But to stand upon the grassy heights of old Sarum, in the calm twilight of a summer's evening, when there is no sound to break in upon the quiet of a scene which Nature seems to delight in adorning with her richest vernal beauty, and to reflect that there down that very hill-side, where now the sweet wild-flowers swing their fragrances in the evening breeze—the Briton has driven his rude war-car—that there, on that now green and mossy crinal the Roman has waved his imperial truncheon, and the invading Saxon has planted his dragon standard, and that, where the golden corn now waves in the western sunlight, there once stood a magnificent Norman Cathedral of which the very foundations have long since disappeared—surely, with these thoughts in his mind, any musician must be interested in a melody which was co-existent with the

ecclesiastical splendour of old Sarum, but which has survived, and is sung at the present day almost everywhere, whilst scarcely a vestige remains of the ancient Cathedral and city which gave it birth. Of such a melody I am now about to speak.

During as far back as the seventh century, the hymn *Tu Jaro ash Jerusalem* was intended to be sung daily throughout the year at Compline, the last of the seven hour offices. With this seven changing office hymn, as unvarying as the night-fall itself, was associated music proper to the prevailing church season; distinctive music which had been sung at an earlier hour of the day to words especially commemorative of the season's doctrinal teaching. Thus music, *per se*, was the means employed, even in those remote mediæval times, for tying with the glorious feast of Christmas, Easter, and Ascension, and the somber shadows of Advent and Lent, words which would otherwise only serve to mark the close of another day. On days in seasons marked by no special observance or teaching, what was known as a *Ferial Melody* became the musical associate of this evening hymn. I will now play it to you—



Observe that it is marked by a simplicity which distinguishes all the older plain-song tunes; no syllable being sung to more than one note. The repeated notes which usher in those of its strains may be said to resemble the recitative portions of a chant; but the ruggedness of this feature is admirably contrasted with the regular vocal outline of the third strain, which well, I venture to think, always retains fresh and charming. Anticipating somewhat the modern device of recitatives, the second strain lies at the interval of a third below the first—a melodic declension which may have been suggested by the summer twilight of the hour of compline, an idea of which is conveyed by the initial line of the hymn.

I have utilized this melody as the theme of a *Prælude and Fugue* for the organ,\* for church use on a quiet summer evening; and I now ask your kind attention to the *Agaraphan*

\* *Tu Jaro ash Jerusalem*, a *Prælude and Fugue* for the organ, by Charles W. Fiske. London: Music Publishing Co., 54, Great Marlborough Street, W.

of the hymn-tune by means of which most of its ruggedness is softened and toned down—



The following is the second subject of the prelude—



The fugal theme is a portion of the foregoing melody rhythmically altered—



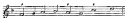
In the stretto of the fugue, the unaltered hymn melody is thus used against the various entries of the foregoing subject—



It is a well-known fact that many German Chants, and some of our most familiar Standard English Hymn Tunes lend themselves to *canonic treatment* of a character more or less free. This I need not enlarge upon; all who know anything of the writings of classical organ composers will at once remember hundreds of instances of such canonic treatment as I am referring to. But it is perhaps rather a novelty to hear what is popularly termed a Gregorian melody go through the canonic mill. The ancient tune which has been revived by Mr. Helmore for use in the sublime Christmas Office Hymn *Corde Natus ex Parente* is not as old as the melodies already noticed. It is from a MS. of the 15th century at Wittenbittel, and bears a close approximation to modern tonality. Observe how the fourth strain has note for note at the interval of a perfect fifth below the second strain—



how the fifth strain is in some measure recapitulatory of the first—



how the sixth strain more than suggests a well ordered transition to the key of the modern dominant—



and how the seventh strain, like the fifth, is a kind of recapitulation of the first—



Without changing the relative pitch of a single note of this melody, and with but slight rhythmical re-arrangement, a Canon 4 to 2 at the octave below can be formed out of it. In the following\* illustration the hymn melody will be assigned to both the violin and violoncello.

\* See "*Corde Natus ex Parente*," a Symphonic Poem for the Organ, by Charles W. Purcell, pp. 20, 21. London Music Publishing Co., 35, Great Marlborough Street, W.

I have already alluded to the thrilling treatment of the Plain-Song Melody *Veniſſis Regis*, in the March to Calvary of Gounod's "Redemption." More than a mere passing reference to so well-known a number of so popular a work is of course unnecessary; but it will be as well to remember that the great French composer secures his dramatic effect by keeping the plain-song theme chiefly in long sustained whole bar notes, whilst against this unyielding *Canto Firmo* he writes his strongly-marked and highly characteristic march rhythms. Some such mode of treatment as this would appear to be the approved, or at least the favourite, method of dealing with ancient themes, when they are employed as subject-matter in modern works. At any rate, we may assume that this is the case, when we compare "The Redemption" with Sir Arthur Sullivan's "Golden Legend" or "Festival Te Deum," in which latter work "St. Ann's Tune" undergoes this kind of treatment. I believe that an equally dramatic effect could be obtained by reducing the plain song melody itself to rhythmical shape, and by combining it with secondary figures and themes of a sustained character, or of slower rhythm than that of the altered ancient theme itself. I will now ask you to listen to the opening of an Organ Fantasia, on this self-same Passion-tide melody "The royal business forward go," in which, after the introductory trumpet-call, you will hear the theme twice repeated. The first time for full organ, with the somewhat characteristic figure—



which opens its third strain rather dwelt upon. Next, after a cadenza for the choir stop, the theme is heard in the bass in short staccato notes—on the present occasion given to the *violoncello*—whilst above is combined with it the introductory trumpet-call and other secondary figures and themes. The third time, our Ancient Ecclesiastical melody is made to undergo a rather remote modulation in order to prepare the way for the second subject of the Fantasia appearing with a certain degree of freshness, in the key of the relative major; but the general melodic outline of the tune is preserved. You will please, on this occasion, look for the third presentation of the theme to the *violin*.\*

The rhythmical form given to the last two old melodies under notice brings me a step farther, into rather debatable ground. It is one thing to give a clearly defined regular rhythm to a melody possessing at the best but vague and

\* See "The Royal Business," a Dramatic Fantasia for the Organ, by Charles W. Harris, pp. 1-6.

irregularly placed accents, it is quite a different matter to displace, alter, and re-arrange the accents and relative duration of the notes of a melody already existing in a perfectly regular rhythmical shape. Let me explain better what I mean. You all know the melody of the old German Choral *Sis juhs Burg* used by Meyerbeer in his "Huguenots"—



Spohr, in his Symphony, "The Power of Sound," uses this as one of his themes—

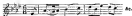


There is, of course, a great deal of difference, contrast, and variety in the mental effects created by these two melodies, and some of you may say that either one of them does not, in the remotest degree, resemble, or even suggest, the other; yet the notes of each were identically the same in relative pitch, and two out of four of the strong first-of-the-bar accents fell upon the same notes in either case.

I need not trouble you to listen to two melodies rhythmically the same, but each composed of entirely different notes, and proceeding by entirely different intervals, because, if we are prepared to admit that either one of these would be capable of resembling or of suggesting the other, we really ought to go just one step farther and assert that the opening phrases of the quick movements in the *Quintets* in "Sémiramide" and "Zarbadore" need only a door knocker performed upon by a supple wrist to make them recognizable to a musical ear. But, with relative pitch, and interval progression remaining constant, it is at least open to question whether either of two melodies entirely varying in rhythm will not, in some least measure at least, resemble or suggest the other. If it be decided that a negative answer must be returned to such a question, I should like to put to such an objector another question—Why is it that sometimes after playing that particular "Song without Words" in *Ab*, by Mendelssohn, beginning thus—



we are irresistibly reminded of another and even more familiar melody by Haydn?—







sequence usually given to the succession of sounds, commonly called *Luther's Hymn*,\* will convey some idea of the pastoral character of the events which ushered in the first Christmas Day; and I further venture to think that all identity with the grim old Second Advent Choral is not utterly lost sight of—



Hitherto I have given but brief extracts to illustrate my subject; now I will ask you to kindly listen to an entire movement, brief, but complete. It is in sonata form, and its second subject is derived from the Ancient Ecclesiastical Melody, *Nocte surgentes*, in the Salisbury Hymnal, adapted by the Rev. Thomas Helmore to the Assumption Hymn, *Humani generis*—

The sights and the sorrows of this world may cease;  
This happy day bringeth glad tidings of peace  
For suffering mortals.

This movement is the Romance of a Trio for Piano-forte, Violin, and Violoncello, and the old melody I wish you to listen to appears in the following form in the "Hymnal Noted"—



I have very little to say in conclusion, except to apologise for the unusual length of this paper, and to thank you for the kind attention you have given me. There is no necessity for a Code of any kind. You have heard some of the arguments capable of being advanced on both sides of the question. It is for you to judge whether the methods of using ancient themes in modern work, which

\* See *Somers as it stands and sings*, for organ, pp. 9 to 14, by Charles W. Pearce. London: Novello Publishing Company.

have now been described and illustrated, are worthy of any recognition by earnest art-workers. It is very likely that I may be unduly prejudiced in one direction by circumstances of birth and early education; but I have, at any rate, done my best to answer the objections raised against the modern use of ancient melodies, and I venture to think that, at the right time and in the right place, a composer may very profitably avail himself of an opportunity of introducing into a modern instrumental work an original treatment of some ancient ecclesiastical melody.

## DISCUSSION.

The Chairman—Ladies and Gentlemen, it is my duty, in the first place, to ask you to record to the lecturer the small vote of thanks for his kindness in sending to us the paper to which you have just listened. But before I put that to you I will invite some members of our Association to say something in addition or reply to the statements which have been made. This subject is, I may say, entirely new to our Society. English musicians would probably have their experience a good deal enlarged if it were customary to devote to the ancient ecclesiastical melodies, and especially to the old modes in which they are written, increased attention; and one sees that there is now more and more disposition to go to the records of the past in support of our modern theories and expectations. The subject of the plain-song is, I venture to say, interesting and useful. In it, for instance, we find the first attempt to make what we call a modulation of any sort or kind; the introduction of what was then the new sound "*Brotundum*" in contradistinction to the "*B quadratum*" certainly marks the first departure from anything like the use of a mode. Our lecturer has given us many incidental quotations from the works of former writers. He mentioned, notably, Rheinberger's *Organ Sonatas*, and made a particular reference to the treatment of a certain ancient melody by Bach. You need not be reminded that Bach, of all writers, was unregarded to the core with the recollection of old plain-song and of its treatment. It would be a very interesting reference for any of you to turn over in that sense the volume of his chorales. Handel also wrote occasionally in the Church modes; a notable example being the chorus from "*Israel in Egypt*," "*I will exalt him*." I might cite many examples of the same sort—the madrigal, so dear to English recollection, "*Sweet honey sucking bees*," of Wilbye is one of them; "*To shorten winter's sadness*" and "*Sheepst thou*" are

others. These instances might be multiplied ad infinitum, and I think they should teach the young members of our profession to examine this subject for themselves. Dr. Pearce has referred cursorily to two points in which it is necessary to study the old modal melodies—namely, their rhythm on the one hand, and their modal peculiarities on the other. In my early days a musician, now gone to his rest, had an exceptional knowledge of this kind of music—Charles Child Spencer. The work he left behind him, which was published originally about 1840 (and a second edition five or six years later) by Novello, is a standard work, so far as a sketch of its length can be, and one volume of Novello's Collection of Musical Fragments was devoted to the subject of plain-song. The style does not recommend itself at first sight to the young musician, but I say he ought not, on that account, to despise the experience to be gained from it.

Sir GEORGE GORDON.—I would first offer my sincere thanks to Dr. Pearce for the interesting lecture he has given us. It is quite a new subject, and I never remember it being treated before, and it certainly is most interesting to listen to any explanation of the way in which the old survivors in the new. I think it delightful to find how indestructible so many wishes and wants are, and how they will crop up again in times much later than those in which they were originally invented. For instance, there is the figure referred to to-night, which I think Dr. Pearce called the *Pavane*, but which I have been accustomed to call *Pavane*. That was, I think, much used in the old Gregorian service music, but it is very curious to find it in full vigour in Sir Arthur Sullivan's "*Pineapple*," at the end of the famous song "*He might have been a Roachman*," &c. It shows that the same want exists in very different times. Then there was a thing which struck me as a little questionable. I understood Dr. Pearce to say that in using ancient melodies, in music written after them, it was right always to adhere to the rhythm and proportion in which they were originally written. That may be right, but it has not been the practice of some masters. I think, for instance, in Bach, the chorales which he used were, in some cases, 100 or 200 years older than himself. He twisted them about in all kinds of ways, altered the rhythm, and the length, and the proportion; and certainly Beethoven does so with his melodies. If you remember, in the *Fine* to the Choral Symphony, especially in the movement *alla marc*, with the double bassoon, how wonderfully he has there modified the great melody in D major, which he gives out at the beginning of the *Fine*, putting it into 3-8; and there are a great number of other instances in his other works. Certainly, in the investigation that I have been making lately, which Dr. Pearce referred

so, nothing is so curious as the way in which my initial melody has been modified or metamorphosed by different great men who have written in modern times. One remarkable instance, which seems to me to open up a new speculation altogether into the nature of melody, is one of Handel's in "Alexander's Feast," "and unvaried remains." The original phrase would be—



This Handel puts into the minor mode, and then still further modifies it by flattening the A on its first occurrence, thus producing this terribly pathetic phrase—



But a number of instances can be found in which that same phrase has been metamorphosed in that way. Wagner uses its uniform progression in "Tristan," "Parsifal," and many other cases, and has also altered it by lowering the different steps of the progression. This is a sort of metamorphosis which does not seem to be regularly recognised, the metamorphosis of increasing or diminishing intervals, and thus altering a tune while leaving its general physiognomy unaltered. Another method is by adding notes in the intervals, &c. For instance, in the tetrachord which Handel was very fond of using, as in "The house and the ruler," which one may call the *New Mode* melody, Handel puts the octave in, as in "For the Lord God" in the Hallelujah Chorus; but this



For the Lord God Om-ni-po-tent regis-at

was not novel, even in him, for Palestrina did it before him. This very morning I found a beautiful example, in which that same melody was taken, altered in the length of its different parts, and one or two intervals put in so as to really completely change the character of it, and yet there the tetrachordal melody remained all the same!

Mr. HERVEY.—I think I shall be expressing the feeling of the meeting if I say with what pleasure and delight we have heard the paper read, and how very suggestive it is, and should be, to us all. It has been my duty (I think I may say my privilege) to examine a great deal of music which Dr. PARSONS has written in that mode, mostly organ works, and I have been struck with the very great skill he has exhibited. He shows that these melodies are susceptible of effective treatment. I may be perhaps pardoned for looking

at them somewhat in the same way as one would look at the old Aryan language; its accents are found in the speech of to-day, some thousands of years after they were first uttered, and just so these old melodies still possess reality. At a very early age in the history of music, when, perhaps, we had little more than a scale, there were gradually built; they were sufficient to express the sentiments of those who uttered them, and sang them, and invented them. Though music has advanced with very great strides, and we have gone from period to period in the gradual developing and extending program of the art, still these curious old archaic melodies continually crop up; we find them still useful, still to be admired for their inherent truth, I think I may say, and always ready to have a fresh face put upon them. With regard to that very charming and beautiful slow movement from Dr. Pearson's trio, I believe there we have something entirely novel. As Sir George Grove pointed out, this is a somewhat new subject; indeed, there is something entirely fresh as to the style of a work of that sort. Hitherto we have had such themes treated on the organ, but Dr. Pearson has very skillfully shown that apart from organ work they are susceptible of delicate and very beautiful treatment from string instruments. These you can get expressions of pathos which, of course, we cannot on the organ, because it is an instrument without agent. In the little illustration from Luther's *Hymn*, one of the pleasures which Dr. Pearson introduced reminded me very much of the opening of Gounod's "Nunciate." That again shows the undying freshness of these old melodies. Occasionally a great composer seizes them, then his fancy comes in, and something fresh is developed from them that we are all glad to get.

Mr. G. A. Ossege.—I think, Mr. Chairman, the subject has been now, in fact, exhausted, but I think we are very much indebted to Dr. Pearson for his very instructive and most agreeable lecture. He has evidently been down amongst the dead men, and has revived all young musicians to follow in his wake. I think that the best thing for a rising musician is to go back and find the true and valuable source of melody, which is the only source really if you want to compose works that will last. As regards the different little motives that have been given to us this evening, showing how composers repeat themselves, perhaps some here will remember a paper that I read, in which I brought forward different examples showing how different composers have unconsciously taken up phrases that had been previously used—of course it was done unintentionally. For instance, if I take the Beethoven quartet, and the beginning of Mozart's example, the last few notes are identical, and not only that, but you have the soothing character of the melody, so that

anyone who has ever heard these two themes is immediately struck with it.

Mr. SCOTTGARD — Would you allow me to remark in confirmation of what Mr. Calverton has said, that the phrase he has referred to has a very singular habit of cropping up. I know of two or three ways in which it occurs—for instance, in the third line of the Prince Consort's raga "Gotha," the third line of that is identical with a portion of "Batti, Batti." Of course I do not accuse the Prince Consort of copying Mozart, it is an accident.

The CHAIRMAN.—The fact is, there is no such thing as exhaustively the old and sometimes much stunted "diatonic scale." For instance, I think Sir George Grove has himself given us an instance of the unexpected introduction of the interval of the octave, which of course is familiar to many of you in the practice of counterpoint. What is that? It seems to me to be but the ornamental repetition by the composer of the same sound. Wanting to avoid the repetition of the exact note, he dips to the octave and back again. It is a mere ornament, and does not violate or qualify the phrase in any way.

(The vote of thanks to Dr. Pearce and the gentlemen who had assisted with Illustrations were carried unanimously, which Dr. Pearce briefly acknowledged.)

MR. G. A. OSBORNE

IN THE CHAIR.

## KEY COLOUR.

By EDWARD WHEELER.

Before commencing my paper on key colour, I would ask you to bear in mind that the instruments I refer to are those with keys—i.e., pianofortes and organs, either pipe or reed. In saying this, I am not allowing that "colour" will enable anyone to name the key played in by an orchestra, because, without perception of pitch this cannot be done; but the fact is, I know very little, and with regard to a very large majority, absolutely nothing of any instrument except keyed instruments. I feel I am quite safe in arguing from this standpoint, because there must be at least fifty pianos to any one instrument of any other kind that can be mentioned.

Key colour is rather a vague term for the characteristics said to belong to certain keys. I remember once hearing of a lady and gentleman who visited one of our good concerts, but left very disappointed and dissatisfied because Madame Norman-Nicola walked on to the stage just like anyone else, whereas she was down in connection with "Op. 25." And this particular lady and gentleman said, when explaining what they had seen, "she might have tried to do it in 25 keys, although we don't believe she could, the stage was too wide." I do not suppose that gentleman is here. If he were, however, he would probably say of my paper on key colour, "there wasn't even a brush, let alone any colour"; but as I understood the subject, I think key colour, or scale colour, is as suitable a term as can be found. Certain keys are said to give tone or colour to a song or a piece. Some keys are said to be bright, others sombre; some full, others thin; one masculine, another feminine; for these different shades of key expression, I do not think a more appropriate term than "key colour" can be found in our vocabulary.

It is admittedly a difficult subject to explain. Theorists account for it by saying equal temperament causes it; that by going into the scale mathematically, it can be proved that all keys are out of tune; that in tuning, a tuner takes



C, say of 270 vibrations—his D should be 301; E, 329½; F, 360½; G, 408½; A, 453½; B, 509½; C, 540. In other words, the second should be flat; third, sharp; fourth, sharp; fifth, flat; sixth, sharp; and seventh, sharp. He then proceeds to tune in octaves, which are supposed to be perfect. These inequalities of the scale are said by theorists to materially assist in giving "colour" to keys; but tuners vary, so do pianos, and no rule can be laid down as to any exact ratio.

Professional men argue from another standpoint altogether. As a rule, they give no reasons whatever; but quote a few well known works—well known choruses or solos, either vocal or instrumental. They will quote "Beethoven's Symphony" and the "Funeral March" as C minor; "Hallelujah Chorus" for D; the "Heavens are telling," C major; "See the conquering Hero," G, and so on. Professional man expresses great surprise, and appears almost to doubt the sanity of anyone who admits his inability to hear anything of key colour. One or two professional men have spoken on the subject to me. One I met in Great Marlborough Street. In speaking of writing music, he said, "if ever you write waltzes, or things of a light nature, always write in flat keys." "Why?" "Because there are ornaments and embellishments to be obtained in flat keys quite unattainable in sharp keys." I naturally asked him to mention a sharp key not possessing anything possessed by a flat key, but the question was avoided; and as a test as to how far his notions of key colour would carry him, I asked, "Could you tell me whether I played in a flat or sharp key without looking at the piano?" "Certainly." "Could you tell me whether I played in six sharps or six flats?" "Most decidedly I could. I could sit in one room, you in another with the piano, and I should see every note in the proper key as you played, in the eye of my imagination." Although it is stated in one of Novello's *Premiers* that G is rich and rich, and F is brilliant and clear, I do not expect any one in this room to say they can (without looking at the copy) tell me, or any one else, whether a piece is being played in F or G. Another professional man, in speaking to me on this subject, declared the peculiarities of each key to be most clear to him. I immediately walked to the piano, and as I struck a few chords, said, "in which key am I playing?" After some consideration, he told me the harmonies rang out so clearly that the fundamental notes were veiled to such an extent he could not distinguish the key. Gentlemen, I am thankful to say my ear is not so sensitive to harmonic influence as his.

Another professional man told me I was thrashing a dead horse, that colour always had, and always would exist, and

that I was not man enough to shake it, let alone show musical people it did not exist. I asked this gentleman if he could tell me whether I played in six flats or six sharps. His reply was, "By the character of the piece I could tell you which you ought to be in." You must all admit that this is backing up my views, for it is obvious that in this gentleman's view the piece gives character to the key, not the key gives character to the piece. I have been told my foolish ideas respecting key colour arise from inexperience, that being a young man accounts for my odd views—in fact, I have had enough uncomplimentary and scolding remarks made to cause many men to hide their views from every one—but until I am proved to be wrong, I feel justified in saying I am right.

I now turn to a name known to most of us—Lussy, the author of Novello's twenty-fifth Primer. He says, "It would be well if composers gave more attention to the characteristic qualities of different keys. Classical composers attach much importance to this." He goes on to say, "An air may be sung in a key, not being the original key, without losing its identity; but it is not the less true that cultivated musicians can recognise and distinguish one key from another, each being characterised by its peculiar quality of sweetness, sourness, harshness, or acuteness. On the piano flat keys are softer than sharp keys. The music of this is equal temperament—i.e., it is the compromise which turns *so* as is to replace by one single chromatic note the two enharmonic notes which theoretically and graphically exist between any major second. The flats for some time past have been correctly tuned, of course throwing more wolf into sharp keys. *Ab*, *D $\flat$* , and *G $\flat$*  are sweet and almost effeminate, whilst *E* and *B* are hard and harsh."

The first thought that struck me on reading this has no doubt occurred to some of you. *Ab*, *D $\flat$* , and *G $\flat$*  are sweet and effeminate. *E* and *B* are hard and harsh. Four flats, five flats, and six flats are soft and effeminate; four sharps and five sharps are hard and harsh. Where is the key having six sharps? If four, five, and six flats are soft enough to be termed effeminate, surely four, five, and six sharps are hard enough to be called masculine. But no doubt it occurred to the author of this very interesting and otherwise instructive work, that as *G $\flat$*  and *F $\sharp$*  are identical in every sense, except signature and names of the notes, he could not get people to take that without a large portion of salt—in other words, to say *F $\sharp$*  is masculine and *G $\flat$*  feminine (especially when we remember that in Novello's nineteenth Primer it states that *E $\flat$*  is the masculine key and *A* minor is the tender womanly key) would not quite go with thinking people. So Lussy leaves *F $\sharp$*  out. But he has said quite

enough to show the remarkable diversity of opinion in two men standing high in the musical world. Lussy says, if you were to play a piece in E<sup>b</sup> that was written in E<sup>2</sup>, you would find it quite as sweetness in some parts and lose energy in others. I can tell you, Ladies and Gentlemen, that unless you have perception of pitch, you cannot tell one from the other, and even if you have perception of pitch, you cannot tell unless the instrument is tuned very closely to the pitch you are accustomed to. No doubt many here are thinking I am wrong, but as the proof of a pudding lies in the eating, so the proof of perception of colour lies in your being able to tell the key being played in on each of, say, three or four different pianos tuned to different pitches. But none of this later on. Lussy also says "there are people who can tell the name of a single note struck on a piano, let the pitch be whatever it may."

Wonderful men have preceded us in the world, men who had not one-twentieth part of the advantages we have—no schools of music, no instruments—whether percussion or wind—to compare with those we have; no such opportunities of getting works performed as we have—men to whom even the most aspiring cannot hope to be anything but as a tiny twinkling star is to the sun. So of those who have joined the great majority I say nothing, but I most unhesitatingly do say, there is, as one here, or in London, or elsewhere, who can name a single note on a piano the pitch of which is unknown to him.

Lussy goes on to say, "Flats are correctly tuned at the expense of sharps." If there is a tuner here, I ask: Is there one key on a piano correctly tuned, let alone all those having flats?

I now come to a sentence in this Twenty-fifth Primer full to the brim of importance. "To be able to tell by the ear"—mark that; "to tell the key, by the ear, in which a piece is being played, is a faculty of the rarest, most essentially spontaneous and artistic; it is difficult to acquire even with the most methodical and persevering practice." This I firmly believe; in fact, I doubt whether the power to name a key with certainty can ever be acquired; if it could, how is it we meet with so few having that ability? If asked what per cent. I thought had "pitch," I should say one, certainly not more. Of professional people possibly ten per cent., but not one of these could name a key if the pitch was, say, a tone below or above. These are, of course, many professional people having relative pitch, but this is very different to absolute pitch. Relative pitch can be acquired, but absolute pitch, I think, is a great gift, a gift that cannot be over valued by those who have it, and the value cannot be estimated by those who have it not. A man having

absolute pitch has relative pitch also. He can teach with less mental strain than another, and, excepting for fingering, he can teach as well, or better, walking about or even in the next room than another not having that gift, even though he gives the very closest attention; he can sing any interval without mental effort or chance of making a wrong note; he can learn to play an instrument, perhaps with the aid of a cheap instruction book, and play in tune, whilst another is struggling on under difficulties quite unknown to him who has perception of pitch. These are only a few of the advantages, but they are not properly valued or even understood. An exhibition organist will speak of an ordinary church organist as a church grinder—the great gift of accompanying is of no value to the exhibition player—and a church organist will speak of the other as an exhibition framework maker—the rapid execution is of no value to the church organist; one neither appreciates the gift nor cares to understand the secret of success of the other.

So it is with pitch, absolute and relative. A man having relative pitch does not understand or appreciate the gifts of the man having absolute pitch; he has not the gift and generally says he does not want it. But he who has pitch, absolute pitch, has relative pitch also, and it is remarkable how many times a relative pitch man can be caught tripping the other; the reverse of this—never. But to return to *Lusky*. He is not alone in saying the gift of distinguishing keys is rare, exceedingly rare; not almost every one tells you key colour is plainly observable. Ninety-nine per cent. will tell you they hear and understand key colour—does how is it the ability to name a key is so rare? There are two sides to a question generally. If the ability to hear a "remarkable difference" in keys, say masculine and feminine, is so general, how is it that even on a person's own piano it is most unusual to find one able to distinguish between F and F $\sharp$ ; but many can between F and B $\flat$ , although these keys are said to closely resemble each other. Why is this? Because F and F $\sharp$ , being only a semitone apart, are too near for any, except those having pitch, to hear any difference in, although, from a colourist's point of view, the difference in character is great; but when we get to F and B $\flat$  I should say one would have a difficulty in finding anyone who would not notice a great difference, in fact, in most cases a most painful difference—yet these two keys are said to be much alike. I feel you must admit this to be a fact. I have never heard anyone say they have any difficulty in hearing the brightness of sharp keys and the mellow, sympathetic effect of flat keys (except the gentleman referred to, who spoke of waltzes in flats), and I have never met anyone who can tell me the key I play in unless the

piano is very near Philharmonic pitch, and then only those who have the gift of absolute pitch. Suppose I gave each of you a copy of a piece to read as I played, and I chose to play a half tone up or down, how many would know I was doing so? Only those who have perception of pitch. I shall be pleased to endeavour to prove this to any who are desirous of proof on some future occasion. It is said by colourists that colour does not exist in vocal music. A vocal quartet in E♭ would not be masculine in effect, although it might be sung by four male voices. Nor would a quartet for female voices in A minor be feminine in character. The difficulties in naming a key, whether the music is vocal or instrumental, are exactly alike—*i.e.*, a person who could not name a key in which instrumental music was being played could not name the key of a vocal quartet, and he who could not name the key of a vocal performance could not do so were the performance instrumental. Yet professional men will tell you colour exists in instrumental music and not in vocal; but "colour" tells there no more in one case than in the other. Is not this a distraction without a difference? It appears to me their position is the same in either case, then why the distinction? What explanation can be offered for this?

I now desire to draw your attention to amateurs. They can hear it, and are anxious to say so too. They think it would be admitting ignorance if they could not talk of blue keys, scarlet keys, rosebud keys, poposa keys, and many other peculiarities. But take their surroundings. Look at the piano, perhaps one good one for mamma and the eldest daughter; but the children, what have they? An old worn-out box of rattles, possibly a few strings left, hammers out through, centres worn, and perhaps moth-eaten; stickier hinges worn, levers out, keys rattling, and heads worn; lessons paid for, possibly at the rate of sixpence per hour. Many amateurs possess pianos of this description, and their children are taught as explained, yet these people will talk to you of the peculiar effects of different keys, and in turn the young ones add their testimony unto the characteristics of different keys, although if anything could be calculated to destroy any knowledge of colour or pitch, it would be the instruments on which many receive their musical education. During a tedious railway journey I once met an amateur who said it was one of the easiest things in the world to name a key being played in, or any single note struck on a piano or sounded in any other way. I must say this man had no idea of my being in any way interested in music, and I did not tell him. I asked him how was it so easy to him when most people found a difficulty. "All you have to do is to associate any given sound with a colour. If you hear D, call it red; if you hear A, call it

brown; if E, call it old gold. If you hear B $\flat$ , call it green; if F, pale green; if B $\natural$ , olive green, and so on." I said: "I have heard of key 'colour,' that must be what the term means?" "Precisely." "Could you name a key by the association of colours with pieces you have already heard?" "Oh, yes, with absolute certainty."

I said I was sorry there was no instrument at hand by which I could have proof of what he was saying. He then said, "I always carry proof with me," and he produced a chromatic push pipe. You all know the construction and working of these useful little things, it will therefore be unnecessary for me to explain them. Before he had time to look at it to see the note it would give if blown, I said: "Don't look at it, pop it into your mouth, blow, and tell me the colour of the note." "Pale Green, F," I asked the colour of D. "Red," said he. I told him he had got his colours mixed, the note blown was a red one, and hadn't a particle of green about it. "Oh dear me, look at this" (the chromatic pipe). I said, there was no need for me to look at it, if he would look that was all that was necessary: he looked and saw proof that his colours were mixed. I could relate dozens of similar anecdotes did time allow. I could tell you of amateurs who say they know every note on a piano, and can tell if anyone plays only "half a note" out, and one who told me she liked my playing because I kept such good time—to use her own words, I kept time to the minute; but all tell you key colour is plainly observable.

Theorists tell you equal temperament explains key colour, and will show, by figures, how many vibrations per second each interval differs from a just interval. My reply to this is, no two tuners tune alike, and, more than that, no one tuner can tune two pianos alike; if he tuned two pianos in *unison* the results would not be exactly together. Let-strings will not account for the great difference said to exist between sharps and flats, because six sharps and six flats, seven sharps and five flats, seven flats and five sharps are respectively identical. Added to this, if my imagination were half as fertile as many colourists, I should say, suppose sharps had never been thought of, and flats had been the only signature, our tonics, E, A, and D, would be F $\sharp$ , B $\flat$ , and D $\flat$ , respectively eight, nine, and ten flats. No one can deny that after the difficulty of learning a piece written in ten flats was overcome, the result of it would be our D $\sharp$ .

Practical men give examples from well known works as proof of colour. Yet "Pop goes the Weasel," or "Haste to the Wedding" will be as danceable in C as in any other key. The Dead March is in C, but there are reasons why no other key would be so suitable as C for that March on modern organs.

B♭ is by some said to be a sad key. Pagan says it is open, frank, clear, and bright. Edwards says it is remarkable for nothing save its dulceness. Robert Sutton, in a most useful little book called "The Elements of the Theory of Music," says B♭ is the balance between strength and richness. In fact, unless two men have put their heads together—so to speak—you cannot get two opinions alike as to the peculiar characteristics said to belong to each key. Key colour is very beautiful in theory, it does very well to talk about to the masses, but to practical minds it is all nonsense. If a man can transpose he can play a piece on a piano and no one except those possessing pitch can give the slightest idea of the key, and those having that gift must hang on for the pitch of the piano to be within quarter tone of Philharmonic pitch, or they will fail. If a piano is tuned C 309.4 or 480.6, the key C is still the key having neither sharps nor flats, G would still be one sharp and F one flat, and so on. The seconds on a piano tuned C 480 will be flat, thirds sharp, fourth sharp, fifth flat, sixth sharp, seventh sharp, and eighth perfect, exactly the same as on a piano tuned C 340, or Continental 327; and gives three pianos, tuned respectively to the pitches mentioned, I am ready to undertake to play two or three pieces anywhere to prove what I have said. Many people will tell you, on listening to name a key, that the effect is only felt when playing themselves. This is no doubt correct, and a professional man would have no difficulty in naming a key if he could catch a glimpse of the keys. If he has "pitch" or even relative pitch, just one note being struck that he could not would be sufficient to enable him to name the key, and as there are undoubtedly fools, who can say and prove key colour to exist? Suppose a man said he could read music; as a test you get two copies each of two pieces, one of each you give to the pianist, the others you give to the man who said he could read. The pianist commences playing which he chooses. The man under examination listens and looks at his two copies, and then says, "Let me see *his* copy—just a glimpse of the name will be enough." What is the natural inference? Why, the man cannot read—he only fancies he can. I once had a boy in my choir who said he could not sing a note without music; but it made no difference whether his music was the right way up or not, or even whether it was another chant or not. Is not this the position of the colourist? He really believes he hears and feels the peculiar magnificence or joyousness of certain keys when he plays, and were he given a piece in, say, D, to read through, as another played in D♭, my belief is he would feel the effect of D. In several cases I have proved this. There is another thing to be mentioned

in connection with tuning—*i.e.*, the absolute impossibility of tuning some pianos at all. I could take you to pianos by Broadwood, Collard, Kirman, Erard, and dozens of other makers, that no man breathing can tune, pianos that have no sweet keys, simply because none are in tune. I could take you to instruments on which there are notes, single notes, that cannot be tuned. Single strings having beats, beats as perceptible in the one string as though you had two vibrating, one three or four vibrations per second faster than the other. If one string beats, how can you tune another to it, or, where a piano is trichord, if each of three strings beat singly, how will they be when altogether? Then consider the usual school piano, a pianetto, an instrument with a fairly good treble, bad middle, very little tenor, and no bass whatever. Take the ordinary pianetto, most of them have so bad a bass that a kick at a water-butt would produce quite as much tone, yet these pianos are all supposed to have "colour."

It gives me great pleasure to say I have persuaded my friend Mr. Crook to give us a couple of violin solos. After the solos I will play a few bars of five different pianoforte pieces that are well known. I ask each of you to make a note of the key in which you think each piece is played. I believe there are a few present who have the gift of absolute pitch, and more who have relative pitch. I must ask each one of you not to communicate his idea of the key to anyone else. The best way is to write—

1. Ballade and Polonaise.
2. Mazurka.
3. Liszt's Piano Concerto.
4. Beethoven's Sonata.
5. Beethoven Concerto.
6. Mendelssohn.
7. William Tell.

As I play, write down the key you feel each number to be in. If each keeps his own impressions to himself, we shall, I think, get different opinions as to the effect, and our Chairman will tell you afterwards who are right and who wrong, for he will know the keys I really do play in.

I have no more to say, except that I sincerely hope that a good discussion may follow, not confined to gentlemen only, for this subject is quite as interesting to ladies as to gentlemen, and they are in every way as able to give an opinion on it as we are. I believe my paper has taken longer than is usual with you, but trust the importance of getting at the truth in this matter will be sufficient excuse. I now ask Mr. Crook if he will kindly play No. 1 on the list.



## DISCUSSION.

Mr. CHARLES STEPHENS.—Before proceeding to this test I think there is one thing of which we ought to be assured, and that is that no deception is to be practised with regard to the pianoforte. I only go upon the basis of absolute pitch, and I should be sorry to be put to shame by saying that you are playing in the key of B when, through the piano not being at the proper pitch, it is actually in the key of C.

Mr. WHOMES.—I am not prepared to say that the piano is Philharmonic pitch, or any particular pitch. If key colour exists it does not matter what the pitch of the piano may be.

Mr. STEPHENS.—But in the other point of view, as one having the gift of absolute pitch, I should be sorry to be convicted of an apparent leak in this matter by the fault of the piano.

Mr. WHOMES.—But I do not say it would be a fault in your case. I should make the same arrangement were I sitting there and you here. I should use words to the same effect; but if key colour exists it does not at all matter.

Mr. STEPHENS.—I know my result will be in accordance with my notions of pitch, and they will be correct throughout.

Mr. WHOMES.—I take it for granted they will be.

The CHAIRMAN.—Before we proceed to hear these different fragments of pieces of music which you will have to decide on, I think it is right we should first offer our thanks to Mr. Whomes for the very charming lecture he has given to us. We may get so engrossed of this discussion that we may, if it is prolonged, forget that we have a duty to perform of thanking him, and, therefore, I propose that it should be done at once. I am very glad to find that there is a key in music which I am very fond of, the key of A minor, which has been called, very appropriately I think, a womanly key, and being a womanly key it must be exceedingly charming. Now we shall proceed, and I believe I am to see that Mr. Whomes is perfectly loyal in what he is going to give us.

Mr. WHOMES.—My idea is not that none of you will be able to tell the key, but only to prove the different effects that certain keys have on different people, and simply to break down the rule that one key is serious and another is not, and so on.

The various pieces enumerated at the close of the paper were then played. At the conclusion the audience was requested to name the keys, which they did as follows:—No. 1 Mr. Stephens gave as being in C minor; No. 2 was named by several persons as being in G major; No. 3 was given by several as in B $\flat$ , and by some as A. Mr. Stephens put it in A. No. 4 was put in E, and by one person in F; No. 5, C minor and B minor.

Mr. STEPHENS said he did not make a memorandum of that, but it was not in C minor; No. 6, A by several persons, or same in B♭; No. 7, E, and by some in F.

The CHAIRMAN then read out the keys in which they were played as follows:—The Ballade and Polonaise the original key as printed and published in G minor, but it was played in G♯ minor.

Mr. WILKINSON.—The violin played in the original key being tuned half a tone sharp.

No. 2 was played in G on the violin and G♯ on the piano. No. 3, B♭; No. 4, F; No. 5, C minor; No. 6, B♭; No. 7, F.

Mr. STEPHENS.—Now you see, Mr. Chairman, in every case I am exactly one semitone below the fact, and Dr. VINCENT is precisely the same as myself, and, therefore, I unhesitatingly say the pianoforte is half a note flat. If I had been listening to a piano at standard pitch I should have been right throughout.

Mr. WILKINSON.—You are right absolutely, but the piano is wrong.

Mr. GILBERT.—Although I have not the power of absolute pitch I was exactly the same as Mr. Stephens and Dr. Vincent in each case. They go by absolute pitch, but I go on a system of key colour.

Mr. STEPHENS.—Permit me to call attention to the simple fact that in every one case I made no variation. If I had varied at all, if I had been sometimes a semitone below, and sometimes above, I should then have been convicted of being in error, but it is not so. Throughout the pieces I have been one semitone lower than the actual notes played, therefore I unhesitatingly say (if any one present has a tuning fork they will be able to verify it) that the pianoforte is not up to pitch.

Mr. GILBERT.—I have no right to speak on this occasion, not being a member; but if you will allow me I shall be very pleased to give you the result of some experience. I am not possessed of the faculty of absolute pitch, but I have the faculty of key colour, and hence it was rather a surprising fact to me that I was just as Mr. Stephens is with regard to the keys of these pieces. It seems a remarkable thing that I should have guessed these pieces, and guessed them exactly. It must be some intuitive perception which I have always been taught to consider as key colour (which I think should be understood as a quality apart entirely from absolute pitch), which is an inherent property of each particular scale which causes it to lend itself to the expression of certain characteristics and feelings of the human mind. When I say entirely apart, I think I am a little in error, because a third or a fourth, or anything less than half a tone, would make such a great difference that I

do not think we could then depend upon the colour. A few days since I had the honour of reading a paper on some peculiarities of musical organisation. Mr. Whymar was the first gentleman who put a conundrum to me at the end of my paper as to the difference between F $\sharp$  and G $\flat$ . Now, I think he generalises too much. He speaks of G $\flat$  and F $\sharp$  with regard to the pianoforte. Now, I maintain that, if you keep to the pianoforte alone, between F $\sharp$  and G $\flat$  there is certainly no difference, but I will ask any gentleman who has composed whether he feels the keys that he may remove to be precisely the same when he composes in F $\sharp$  that he did when he composes in G $\flat$ , and that not being the case, his feeling of the removal from the key should be somewhat different. It gives a certain character to the key of G $\flat$ , which is not obtainable from the key of F $\sharp$ . Again, if we go further and take string instruments, would not a violinist put his third finger usually on the G $\flat$  on the third string and the second finger on F $\sharp$ ? I think that is a sufficient answer to the difference between G $\flat$  and F $\sharp$ . If key colour exists I think that probably the pianoforte is the instrument upon which we should find it first of all, because of the different leverages, and next because of the different lengths of our fingers, and next because of the tuning. We all know that fingers are taught so as to the pianoforte, and we all know that in playing the viola and other stringed instruments, if you want to get a brilliant key, you must write for those keys where the dominants come in in harmony. If you write in the key of A you get the open strings; if you write in C you get open strings; if you write in F you get one open string, but I do not think you very often use that open string. Consequently, all keys are brilliant on the violin which have open strings with their natural harmonics, the octaves and twelfths. D $\sharp$  and A $\sharp$  would be both very sombre. As I said before, I do not dogmatise on the matter at all, but I have a certain feeling that I think may be allied to key colour.

Mr. BRANDES.—There are two classes of key colourists, I believe I may say. There are those who hold that key colour is an inherent property in keys, and there are those who hold that it is the result of an endeavour to tune in equal temperament. Now, with the former class of colourists, those who believe that it exists inherently in music, I can sympathise, in so far as I acknowledge that the higher a sound goes the more brilliant it is. From the very lowest to the highest we have continually increasing brilliancy, arising, no doubt, from the increased number of vibrations. Therefore, to a certain extent, there is a colour in keys, in so far as the higher one is more brilliant than the lower; but with the other class, those who attribute it all to

important, they definitely assign characteristic attributes to various keys. They are described in books as soft, mild, sober, contemplative, cheerful, solemn, grand, gay, sprightly, unassuming, gentle, delicate, burning, charming, religious, pastoral, gloomy, golden, warm, sunny (it does not say anything about moonshine in this particular case), mournful, grave, majestic, meek, pensive, melancholy, keen, piercing, bold, vigorous, commanding, plaintive, awful, dull, noble, mellow (it does not say whether that it is in the opposite sense of sober). Among these attributes are some of a very high character indeed, as majestic, pensive, and so on, and can we for a moment suppose that such distinct characterisation, instead of arising from any inherent property in the key, are simply the result of the tuner tuning those notes unequally? You cannot for a moment suppose that such grand characteristics as are claimed for those keys arise simply from the hangings of the tuner. It is simply impossible to vindicate such a position as that, and I think colourists who pretend to this kind of thing should be put to a very severe test indeed. The "Dead March in *Sad*" has been spoken of as in the key of C, which is one of the brilliant keys, and yet Handel, who knew what he was about, wrote this, not only in a brilliant key, but it is a remarkable fact that throughout the whole composition, with the exception of the close in D minor, every chord throughout the whole work has a major third. When you admit, as everybody must, that the "Dead March" of Handel is most deeply impressive, and goes to the hearts of the listeners, and at the same time Haydn wrote the brilliant chorus, "The heavens are telling," in precisely the same key, what is the commonsense of talking about the characteristics of the key when you find two works so entirely opposite in character written in exactly the same tonality? Now, as we are dealing with funeral marches, we do not find the key of C prescribed, for Chopin has written a splendid one in B $\flat$  minor, and Beethoven one in A $\flat$  minor, but he did not stick to that in the "Erebus" Symphony, in which he wrote one in C minor. Mr. Edwards says that B $\flat$  is remarkable for nothing but its dulness. I suppose the gentleman who wrote that never heard Beethoven's Symphony in B $\flat$ , for the last movement at any rate has an amount of hilarity that is perfectly astounding. In fact, one of the most hilarious movements ever written is in the finale to that B $\flat$  Symphony of Beethoven's in the key which Mr. Edwards says is remarkable for nothing but dulness. Another writer, Borbitt, says the key of B $\flat$  is least interesting of any. It has not sufficient fire to render it majestic and grand, and is too dull for song. I suppose he never heard the song of "Rejoice greatly," from "The Messiah," which is almost too hilarious for an oratorio.

composition, but that is in the very dull key of B $\flat$ . Again, we find that in the key in which the "Adelaide" of Beethoven is so beautifully set, and there is no delusion in that composition surely. How absurd to say that it is not fit for song! The key of B $\flat$  has somehow become associated in our minds with hoarse choruses, probably because they are very often accompanied by the horn, and the key of B $\flat$  is a good key for horns. Yet this is precisely the key in which Handel wrote that most touching air "He was despoised." At the same time, to show that it is not capable of only one phasis, we find also that the finale to Beethoven's "Les Adieux, l'absence, et le retour," one of the most hilarious movements, is also in the key of B $\flat$ . The finale of Weber's Concerto in B $\flat$ , which is also suggestive of hilarity, is also in this same key. I have shown you that a composition of the most tender and touching character can be written precisely in the same key as one of the most hilarious. Let us come in that of A minor, which Bombét has spoken of as plaintive. Mr. Bombét ought to have heard Mendelssohn's *Soltarello*, the last movement in the "Italian" Symphony, but he unfortunately had not an opportunity of hearing that, as he died before it was written. I think that in this discussion sometimes the words sharp or flat are calculated to mislead us, because the word sharp seems to indicate something acid, something piercing, whilst flat seems to indicate something dull; but in reference to the names of musical notes it has no such signification whatever. We simply call a certain note B $\sharp$  to distinguish it from B natural, and I wish to point out that the meaning of sharps and flats refers to pitch, and not to the character of any notes; that, while we climb on the left hand the order and cycle of keys, all we have to do is to pursue our investigation on the other side, and then the very keys you call flat are sharp keys. We begin with C, go on to D, A, E, B, F $\sharp$ , and G $\sharp$ , G $\sharp$ , D $\sharp$ , A $\sharp$ , E $\sharp$ , and, lastly, B $\sharp$ , and so we have made them all sharp keys. It is a matter of expediency to call notes by different names, and if we start, in travelling, backwards, we call those we have hitherto called sharps, flats. There is no difficulty, in my mind, with regard to the word "sharp" or "flat," it does not impart character, it merely indicates pitch. I wish to make a very brief summary of my remarks, which is to this effect, that the character of a work rests on the genius of the composer, and not on the particular key in which he writes; secondly, as a corollary to that, I would say that the whole range of keys is open to the composer for whatever particular phasis of thought he desires to present.

Mr. WILKINS.—May I just say one word in reference to a very strange coincidence, viz., that Mr. Gilbert wrote down the same notes that Mr. Stephens had written down. In the

first place, it cannot be key colour, because he was clean away from the key every time—half a tone too low. Mr. Stephens was perfectly right as far as Philharmonic pitch goes. I should have done precisely the same thing; but Mr. Gilbert was wrong in this case, and must be wrong if he says colour has anything to do with it, because the colour of C and Cg are supposed to be entirely different. I should say the fact of Mr. Gilbert writing down those same keys that Mr. Stephens wrote down was owing to relative pitch; he heard the violin tuned, and according to the violin he was quite right. I should think that his ear retained the pitch of the violin, and from that he took the keys. That is relative pitch.

Mr. GILBERT.—I am much obliged to you for giving me credit for a power I did not know I possessed before.

Mr. SEYMOUR.—I take it those who agree with key colour think it only exists on the pianoforte and instruments of that nature, and the reason given is probably the correct one, the imperfection of intars. I do not understand that they allege it to exist in the violin or other orchestral instruments.

Mr. GILBERT.—Oh, yes.

Mr. SEYMOUR.—Only as far as the open notes of the fiddle, and open notes of tubes are concerned. I would propose one new test, which might possibly, to a certain extent, help to settle the matter. Supposing you were to have two pianofortes of the same character, by the same maker, one of them an ordinary pianoforte, let us say, fitted with a transposing keyboard. It is asserted that makers have a predilection for certain keys, and that they accommodate their intervals accordingly; now supposing we tuned one pianoforte to Philharmonic pitch, and we ask him to tune the other pianoforte to the French diapason, or any to exactly a semitone below, and then, having tuned the piano so, of course one would be just a semitone below the other. Then shift your mechanism of the transposing pianoforte down one semitone, and of course the keys of both would be found identically the same, or they should do so. Supposing, then, the two performers, one on each pianoforte, were to strike the notes together, the ear would be able to detect whether there were any beats, showing whether they were tuned exactly alike. By that means we might arrive at something like an idea whether the tuning was the difficulty in question, and had caused what is termed key colour, or whether any actual difference existed between the keys. I take it there must be some small difference found between them.

Mr. WOODS.—There is another way which would not be quite so much trouble. I have two pianofortes similar in

power, tone, and condition: tune C 340 on both; clean sea, tune the other throughout—when finished, close it. Go to the second piano, tune that from the C already tuned, when finished, try them together: they will be found set in unison. Showing learners do not cause "key colour," simply because they cannot tune twice alike.

(The chairman then put the vote of thanks, which was carried unanimously, and also a vote of thanks to the Chairman.)

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MR. W. H. CUMMINGS

IN THE CHAIR.

THE DOUBLE BASS.

By A. C. WHITE.

MR. SECRETARY.—Before the paper is read, I wish to make a few observations on the discussion which ensued on the very interesting paper which was read at the last meeting. On that occasion Mr. Whoman challenged the audience, and I accepted the challenge, to name the key of every piece that he played, the pianoforte being concealed from us. I put down on paper, and read afterwards, the key of every piece which he played, as they appeared to me at least, and the Chairman, who had sat at the pianoforte, came afterwards to the table and read out the key in which he had seen Mr. Whoman play. In every case the key in which Mr. Whoman had played on the pianoforte was a semitone higher than the one I had named. Now I am very anxious that any impression should be removed that I had been guilty of a failure on that occasion. It was simply that Mr. Whoman had, for the special purpose of his lecture, caused the pianoforte to be tuned a semitone lower; consequently, I was right in every instance, and Mr. Whoman has kindly come here on this occasion to corroborate what I say, and acknowledge that, for the purpose of his lecture, he was obliged to practice what, applied to my own particular case, would appear a deception, and he will acknowledge, I believe, that I was right in every instance as regards the true pitch, and when a selection from a Concerto of Beethoven in C minor was played, I said, not in C major, but in B minor, and so it proved. After several of the audience were gone away, we compared the pianoforte with another one in the room, and found it was exactly what I have said, half a tone below pitch; therefore, whatever the position may be with regard to tone adjustment, I wish to claim that I was in every instance correct in my judgment as to the key which was played.

MR. G. A. QUAKER.—As the Chairman on that occasion, I wish to say that every one who was present, I think, were



all perfectly persuaded before they left the room that Mr. Stephens was right.

Mr. WATSON.—I think Mr. Osborne and everyone in the room knew that Mr. Stephens would have been right had the pianoforte been tuned to concert-pitch, and the fact of his naming the key a semitone below every time proves most conclusively that he has the gift of pitch. That everyone failed in naming the key in which I played on the piano-proven, I think, that key colour has no evidence whatever.

The CHAIRMAN.—I think we need say no more about this, except, although I was not present, I can answer for this, that there is no man living who has a more accurate sense of pitch than Mr. Stephens. I will now call on Mr. White to read his paper on "The Double Bass."

When I was first asked to read a paper on the double bass, I hesitated, thinking I could not possibly make it sufficiently interesting; but as I was informed that there had never before been a paper read on the subject, I consented to do it, trusting to your kind indulgence of my shortcomings. It is not my intention in this lecture to attempt to describe the history of stringed instruments, as that can be read by anyone interested in the subject in a very elaborate work written by Mr. G. HAUT. All I need say is, that bowed instruments were in a very primitive form and shape up to the sixteenth century, and that the great Italian maker, Gaspare da Salò (who lived in 1550), was the first to raise the manufacture of bowed instruments from a rude state to an art.

We read that even the ancient Hebrews had some sort of a stringed instrument, a viol, which they used to sound with the scratch of a horse-tail bow; and the fiddle which Nero played upon while Rome was burning must have been a very different instrument to anything we should call by that name now. Mr. Haut says that Gaspare da Salò and Magini made many good double basses; these instruments formed the stepping stone to Italian violin-making, for they were in use long before the first use of the violin, and the number of basses at that time, compared with the violins, was ten to one, a fact which goes far to prove that the bass was the principal instrument then, and that the viola, which we all naturally look upon as the most important of stringed instruments, is only the great grandchild of the double bass.

The double bass is, as you are aware, the largest of stringed instruments, producing sounds an octave lower than those written, so that when the cello and bass play together, as they usually do, the effect produced is the same as when a passage is played an octave on the piano. Sir George Grove, in his Dictionary of Music, says—in reference

to the double bass—"If the violin is the so-called leader of the orchestra, the double bass is its foundation; to it is given the lowest part on which both harmony and melody rest."

All that can be read in books, but, as an exponent of the double bass as played at the present time, I will now proceed to tell you what I have gained by my own study of the instrument.

The various methods of tuning and stringing the double bass have ever been a great drawback to this instrument; undoubtedly it was originally mounted with three strings only (as was the violin), but now the violin, viola, and violoncello have four strings, and are invariably tuned in fifths; not so with the double bass, for we find a different method of tuning in almost every country. In Italy, as in England, we formerly used three strings tuned in fourths, A, D, G. In France they tuned G, D, A, in fifths. In Germany they have four strings tuned in fourths, E, A, D, G. This is a very good system, because the scale lies under the hand without any need of shifting the position.

The French tuning in fifths, G, D, A, necessitates shifting at every scale. The Italian and English systems were the same as the German, minus the low E, basses with three strings have undoubtedly more brilliancy, but now-a-days the fourth string for orchestral playing has become a necessity, since modern composers very frequently write for the lowest notes.

There was a very celebrated Italian double bass player named Dragauetti, who came to London in 1794, and died as recently as 1848, aged 50—and though it was before I came to London to join the musical profession, which I did in 1849, yet Mr. Howell, my master, who succeeded him as principal of the Opera, and whom I have since succeeded, used to tell me many stories about his wonderful performances on the double bass.

He was so hale and hearty almost up to the time of his death, that at the age of 50 he headed the basses at the Beethoven Festival at Bonn. I was told he tried various ways of tuning and stringing his basses; he even tried five strings at one time. He was a wonderful concertist, and in the orchestra he always tuned his three-stringed bass in fourths, with A for his lowest note; and that remained for many years the standard system in England. It had its drawbacks, because we always had to invert the low passages and play them an octave higher, which produced a different effect from that intended by the composer.

I was among the first to tune my A string to G, gaining something by that; but as time went on, and we had so much modern German and French music to play—Berlioz, Wagner, Brahms, and others following in their wake—I found

it necessary to alter my system in order to fulfil my engagement at the Richter Concerts and add an additional string; and now that I have done so, I like it very much and find it very effective at times. But when I got a German string bass to see what I could do on it, I found that the strings were so close together that when I played with any force, they rattled and produced anything but musical sounds. I therefore consulted Bocklanger, the excellent instrument maker in Fifth Street, Soho, and he carried out my wishes to the full extent, and I think that the result is in every way satisfactory; the bridge I had made very much broader, so that the distances between the strings should be the same as they were on the three-stringed bass, giving plenty of room for vibration; the neck I had necessarily made larger in proportion. I can therefore play with as much force on my four strings as I could on three. When I had added the fourth string, I found that E was not deep enough, as frequently in Beethoven's symphonies we find passages written down to E<sub>2</sub>, as in the *Eroica* Symphony, and in the Choral Symphony to double D often; again, in the Pastoral Symphony, we find even double C, this being the lowest note on the violoncello. I imagine Beethoven left it to the basses to do the best they could with it, and all they could do was to invert the passage and play it an octave higher. As this was the only instance I know of where the double C was required, I decided to make D my lowest note, and, when the C was wanted, to let the string down; but it is not very necessary, as it only occurs two or three times in the whole Symphony—in the slow movement and towards the end of the *Finale*. Mendelssohn, in "St. Paul" and "Elijah," has frequently written down to double D. Thus my bass stands tuned D<sub>2</sub>, G<sub>2</sub>, D<sub>2</sub>, G<sub>2</sub>; the double D being a very fine note, having the vibration of its octave in addition to its own sound. Since I have adopted this manner of tuning, I am glad to be able to say that many of our English bass players have followed my example, and I believe in a few years three-stringed basses will be as rare in orchestras as four-stringed ones were formerly. Mr. Nares at the Crystal Palace, and some other conductors, prefer to have in their orchestras a mixture of three and four stringed basses. Often I find a curious conglomeration of basses strung and tuned in various ways. I cannot think this is good. Other conductors stipulate for four strings only, irrespective of how they are tuned. My idea is that all the basses should be tuned in the same manner as the violin, viola, and violoncello invariably are. I think it would be a good thing if we could have a conference of double bass players and composers to decide which is the best manner of tuning, as music written for one system does not suit any other, hence

the paucity of music written for this instrument. I have myself just published a solo on the German air known as "Im tiefen Keller," but unless the bass is tuned as I use it, it could not be played except with great difficulty and without effect. Another drawback to the study of the bass is the great expense of providing an instrument, and then when you have got it, you cannot carry it about with you, and it involves much expense in postage or cab fare. A good enough violin might be had for a few pounds, but you cannot get even a second or third rate bass under at least £10 or £15, and if a better class of instrument is required £40 or £50 has to be paid.

I have four basses constantly in use at different places, and I had to borrow this fine bass (a Montagnana) to bring here to-day, as my others were all otherwise engaged. I know of two fine basses at the present time lying idle at the Royal Academy of Music; these instruments would be improved by being used, they do not wear out like pianos, but improve by use and age; there they are on the top of a cupboard at the Academy. Now if the owner of these basses would allow them to be used, he would confer a great boon upon us, and would encourage students to learn to play upon them.

Formerly the double bass was a most popular instrument amongst amateurs; the late Duke of Leinster, Sir Frederick Halliday, Canon Rowden, and many others used to play upon it, and double basses were at a premium. Now-a-days there is very little sale for them. Mr. Howell's beautiful Paganini bass (which during his life-time he valued at £500) was sold some time ago for £68. Dragonetti was offered £200 for his Gaspari (his favourite instrument), and he refused it; but I hope we shall again see the day when basses may be more appreciated than they are at present.

Independent passages for the double bass were unknown until the nineteenth century, with rare exceptions; but Haydn and Beethoven (who, by-the-by, played the bass for his own amusement) wrote for it independently.

Another point to which I should like to call your attention is the shape of our bows. In most countries they use a straight bow, resembling a violoncello bow, though shorter, and held in the same way. The one we use is called the Dragonetti bow; originally the arch was very much greater than it is at present, but Dragonetti improved it before the end of his career, and as he left it so we use it and consider it perfect.

Some think that the freedom of the wrist is impaired by holding the bow as we do, but I beg to differ from them. The action of the wrist is as free whether in the downward or sideway movement, and the advantage I claim for our bow is the greater amount of force procurable for the *fortissimo*

passages. This percussive attack cannot be and is not so forcible with the straight bow. Bottesini, the famous artist and double bass player, who has been playing solos on this instrument all over the world, and in London quite recently, plays on a smaller instrument than we do, and uses a bow similar to this one (a straight bow), and takes each string a note higher, in order to obtain more brilliancy in the harmonics, which are very brilliant on the double bass. I consider it a lesson to any musician—vocalist or instrumentalist—to hear Bottesini play, his style, execution, and phrasing being perfection. I should advise anyone who has not heard Bottesini perform to take the first opportunity of doing so. I do not think Dragonetti could ever have played in the delicate manner of Bottesini—the former went in more for volume of tone.

The double bass as a solo instrument is rarely heard, and yet in the hands of a skilful performer it is capable of producing most pleasing and sympathetic tones.

I played a solo at Hereford a short time ago, by request of the Philharmonic Society there, and such a thing had never before been heard in that city. The audience at first seemed inclined to laugh (they usually do) at the ponderous sounds, and the gymnastics that I went through, but when I arrived at the slow movement they began to feel it was not intended as a comic performance.

Dragonetti with the bass, and Lindley, his companion for many years, with the cello, used to delight their audiences with their accompaniments to the recitatives in the oratorios and operas—now a thing of the past, for since Sir M. Costa died, and the Sacred Harmonic Society passed into other hands, the recitatives are accompanied on the organ in oratorios, and with a quartet of strings at the opera.

In the former case the organ is so far from the singer that they are seldom together, and for my own part I think when the recitatives were well done on the violoncello and bass the effect was much pleasanter to listen to. There are, however, various opinions on the subject.

I understand that when Beethoven's Choral Symphony was first performed at the Philharmonic Society in London, Dragonetti played the recitative and presto in the last movement alone.

I do not know whether the other basses were unequal to it, but now all the basses play it, or try to do so, so we have advanced since those days. I wish, however, that bass players would not think, as so many do, that they require no instruction to enable them to play in an orchestra. Many that I see do not know how to hold the bass, how to finger, or how to draw the bow across the strings properly, so as to produce pure tone.

Five-and-twenty years ago Sir M. Costa prided himself on having in his orchestra, some of the finest instruments in the world, and players to match, and as they all (with one exception) tuned their basses in the same manner, the effect was marvellously powerful and grand; now-a-days I have seen in orchestras basses played on which might have been made by a village carpenter, and not worth thirty shillings.

Since Madame Néruda made it fashionable for ladies to play stringed instruments, several ladies have had even the courage to try their hand at the double bass, and the remarks I previously made apply equally to them.

I am a Professor at the Royal Academy of Music and the Royal College of Music and at several minor institutions, and at the present time I have not a single pupil at either of any of them.

Considering the bass is the foundation on which the fabric of a composition is built, it is a pity more young men with strong muscles do not study this grand instrument. It has a healthy developing power, expands the chest, and strengthens the muscles of the arm, and as a proof of the longevity of bass players, we have Dragonetti playing up to and over ninety, and at the present time I can name two octogenarians still playing away, and, as far as I am concerned, I have never had a day's illness since I joined the profession, thirty six years ago, notwithstanding the late hours, vitiated atmosphere, cold draughts, and exposure to the cold after the intense heat of the rooms and opera houses in which we work.

I will now tell you an anecdote of the great double bass player, Dragonetti.—At the age of eighteen he succeeded Durini as primo basso in the orchestra of the chapel belonging to the Monastery of San Marco, Venice. The procurators of the Monastery, wishing to show their high appreciation of his worth, presented the youthful player with a magnificent contra bass by Gasparo da Salù, which had been made expressly for the convent of St. Peter by the famous Brescian maker.

Upon an eventful night the inmates of the Monastery retired to rest, when they were awakened by deep rumbling and surging sounds, unable to find repose while these noises rent the air, they decided to visit the chapel, and the nearer they got to it, the louder the sounds became; regarding each other with looks of mingled fear and curiosity, they reached the chapel, opened the door, and there stood the unknown cause of their fright, Domenico Dragonetti, immersed in the performance of some gigantic passage of a range extending from the sea to the bridge, on his newly-acquired Gasparo.

The monks stood regarding the youthful performer in

amusement, possibly mistaking him for a second appearance of the original of Tartini's "Sonata del Diavolo," his artistic majesty having substituted the contra bass for his violin.

Upon this instrument Dragonetti played at his chief concert engagements, and though frequently importuned to sell it by his numerous admirers, declined to do so, refusing most tempting offers for his treasure. In his youthful days he decided that his cherished Gasparo should return to the place from whence he obtained it—the Monastery of San Marco—and this wish was accordingly fulfilled by his executors in the year 1848. It was felt by Dragonetti's friends and admirers that to consign the instrument on which he had so often astonished and delighted them with the magic tones he drew from it to the care of those who possibly knew nothing of its merits was rather to regret. ("The Violin," by G. Hart.)

I was anxious to get all the information I could respecting the instrument I was about to lecture upon. I wrote to my old friend, Mr. Charles Squire (one of the octogenarian bass players I spoke about just now). As I knew he had played for many years in the same orchestra with Dragonetti, I thought probably he would be able to give me some information respecting this subject. The letter arrived too late for me to add to my Paper, but as it contains information about Dragonetti, with your permission I will read it to you:—

"36, LIVERPOOL ROAD,

"March 30, 1887.

"DEAR MR. WAITE,—I do not know how I can assist you in the double bass enquiry, but as you no doubt have ascertained everything in connection with the early history of the instrument, I can only supplement this with what I remember of Dragonetti. Dragonetti had experimented all through his long life in improving and perfecting the capabilities of the instrument. He had used four strings, and he had at last settled down to three strings, as they were at his death.

"He used to lower the A to G occasionally, and in the case of 'Softly sighs,' from the 'Fidelio,' he went down to—



for the first two movements.

"The solo you refer to was in the Choral Symphony, and it produced a marvellous effect. Mr. Cipriano Potter told me he once played Beethoven's Sonata (violin) in F, with him—



when he played the violin part in harmonies, the same pitch as the violin; but these notes were produced in the lower part of the finger-board, as we play ordinarily, so that he must have produced notes two octaves higher than the stopped notes.

"This secret has died with him. Mr. Porter had written several pieces for him, which he showed me at the time. It would be interesting to find these pieces; perhaps Mr. Porter, the Society's eminent physician, his son, could find these things.

"Old Dragonetti was celebrated for his rushing up to a note like this—



on all parts of the instrument, producing an effect like thunder. Old Lindley, the celebrated cello, told me he played fifty-five years from the same desk with Dragonetti, and, in fact, Dragonetti used to lead the orchestra, for there was no conductor in those days. I am afraid I have given you very little information.

"I will conclude by saying that you rented me more than anyone of the manner of old Dragonetti.

"Your command of the four-stringed bass is most admirable, for hitherto the manner of playing the German bass is of a 'dawdling character'—no dash—no attack; you manage it with great power of effect, and the attack is perfect, and as I said before, brings to my recollection the best points of old Dragonetti. I say all this *avec respect*, and in all truth and frankness.

"I am, yours sincerely,

"CHARLES SEYMOUR.

"I am very well, I have just begun eighty-one years of age."

The illustrations by the lecturer consisted of the following pieces:—Ranzanne in E. B. Tours; Etude Mélodique, G. Bottadini; Old German Air, "Im tiefen Keller" (with variations), A. C. White; and the celebrated solo composed by Dragonetti (edited by A. C. White).

## DISCUSSION.

The CHAIRMAN.—Our first duty, and a very pleasant one it is, is to accord Mr. White our sincere thanks not only for his paper, but for the examples he has played to us. At the same time, I am sure I should only be representing the



general feeling when I say I deeply regret the circumstances which have prevented Mrs. White being here. It now remains to invite remarks from any of the members present on the very interesting paper we have heard. I would say one thing regretted with regard to the history of the instrument. Mr. White commenced by informing us that the double bass was the parent of all modern orchestral string instruments, the viola and violin. No doubt it was so, and remains to a certain extent in that position. In many monasteries abroad they still accompany the mass only with double basses, sometimes supplemented by a small organ, but frequently only the double bass amongst voices. We had something akin to that in the way in which music was taught until a very recent period. All students were taught in harmony to construct the bass part before the melody; now-a-days, when we have so many ballads, we rarely get a good bass to the harmony, it is only melody that will suit to a barrel-organ that is produced; but certainly, up to a very recent period, down to the time of Purcell, it was not so. He says distinctly in one of his books he wrote for Playford: "Formerly they used to compose from the bass, but modern authors compose to the treble, when they make counterpoint or basses to tunes or songs." He was the first man to point out that melody was a very important thing, but that the ancients did not make melody, because their basses were always melodious, at least they endeavoured to make them so. Another thing struck me just now, when Mr. White was showing the bow and the use of the bow, and especially the Dragma's bow, it struck me that form was adopted, not probably for its better shape or convenience, but they had not at that time found out the way of managing the worm and screw. In all portraits of string players, down to a very late period, the violins were played with a bow not quite as much bent as this, but of this kind; they had no nut for screwing up the hair, but were obliged to tighten the hair by pushing the finger through underneath. That clearly was the reason why the bow was made in that shape. When they came to make the nut and screw, so that the hair could be tightened, there was no longer any need for the performers to push their fingers down, which must have been an extreme inconvenience, to tighten the hair. That is an impression which I arrived at from studying the old painters. You will find the great player of the viol de Gamba, Abel, is depicted in that fashion, pushing the hair out with his finger. Another matter touched upon was the recitative accompaniment. It is not quite the fact that the practice of accompanying the recitative by the organ or quartet of strings was introduced since Costa's time, because he himself did it. In "*Judas Maccabæus*" he had the rec-

trium accompanied with a string quartet. He did not do so in all the orchestras, but when he came to write an orchestra himself, "Eli" or "Naaman," he took care not to write for the bass and cello solo. I think that shows that he felt the time had come when some change was needed. I would say that we had got accustomed to the solo bass, as it was performed in the early days when Demossio and Lindley played it, although I cannot say I know much about them, though I have seen them, and even later than that, when we had very excellent violoncello players, who were accustomed to play Handel, it probably went very well indeed; they studied harmony, and knew how to put the harmonies in; but when we got gentlemen from over the water, who do not know anything about Handel, and they came to play Handel on the cello, they do not know very much about harmony, the effect has not been so agreeable. I remember some years ago, at the Birmingham Festival, after a performance, when we had had one of Handel's orchestras accompanied with cellos, Theodore Thomas, the American conductor, came out to have lunch with me, he said, with regard to recitatives, "Do you always accompany them in that way?" I said, "Yes, we did." He said, "By Jove, it is just like a Japanese Festival." As he was a great traveller, I could say nothing to that, I never heard a Japanese Festival and did not know what it was, but it struck me as very remarkable that he should make a statement like that. I will not detain you longer, as there are many musicians here capable probably of throwing some side lights on this interesting subject. We have seen very clearly what a noble instrument the double bass is in the hands of such a performer as Mr. White, and I hope his remarks will lead to some consensus of opinion amongst double bassists, who will come to the conclusion that his method of tuning is the best. I am quite sure of it myself. I do not know anyone who plays the instrument like Mr. White. When you want accent it is always there, when you want phrasing it is there, and true intonation. If he will take this matter in hand, and induce his brethren to follow his example, it will be to the great gain of art, and much to the advantage of our ears and comfort.

Mr. HARRISON.—I do not know that I am entitled to speak, as I am only a visitor and an amateur double bass player, which is not much talk to consideration, but I think something is to be said for the three-string system. There is no doubt in the old days the effect Mr. White alluded to, when all double basses had three strings, and were all tuned in the same way, was finer than any we have had since. I think Mr. White will agree with me.

Mr. WHITE.—Certainly, but I think if they were all tuned

the same way that I tuned them, we should get the same effect.

Mr. MATTHEWS.—Then there is another point. The instrument, I believe, was constructed to carry a tone as low as *A*, or possibly *G*, but if you want to go down a fourth lower, you must have a larger vibrating table, you must have a larger instrument. Mr. White is an exceptional player, but even with his playing the tone of the fourth string was not to be compared with the tone of the other strings.

The CHAIRMAN.—The lower you go in sounds, the less comparable the sound will be. It is more difficult for the ear to detect it. For instance, the lowest note in an organ cannot be heard by some people at all, they only know that there is a rumbling sound.

Mr. MATTHEWS.—I will put it in another way. Probably most people here are pianists and organists, and they have had to play on a small cottage piano. You all know what the bass of a piano is, and you know what the bass of a chamber organ is like with that burden which officiates for everything; you cannot get the same effect. I think it is the same with the double bass, if you want a fourth lower you must have a larger instrument. The thing is not constructed to go down to that pitch; and I do not think it will ever be done satisfactorily; of course, Mr. White has a very exceptional tone, and it is hardly fair to compare the results he obtains; but if you mix up with orchestras very much, as I do, or in sufficiency to hear the effect of four-string double bass, I think there is very much to be said in favour of the old system. If we have a lower compass, we must have a larger instrument.

The CHAIRMAN.—As a matter of fact, most four-string basses are played with the modern German bow, and then you cannot get the tone.

Mr. MATTHEWS.—But even with the other bow the tone goes off, I think; it becomes very much a matter of personal equation. Mr. White, at present, is the only one almost who plays the bass tuned in that way; he has sufficient skill to bring out the tone, but, I contend, the result will never be satisfactory.

Mr. SCHUBERT.—The tone always appears to be weaker on the fourth string, in proportion to the others; it has not the same power. Now some have the string covered with wire, does that make any difference?

Mr. WHITE.—The reason for having it covered with wire is that you may have a thinner string. You want a very much thicker gut string to produce the same depth of tone.

Mr. GIBBS.—Does covering with wire make any difference in the tone?

Mr. WHITE.—I do not think it makes much difference, except that it may be easier to play.

Mr. SWEETMAN.—I think it is not to be visited as a reproach to the lowest notes that they do not come with the same definiteness. With regard to the organ, the 32-ft pipe is not only a slow stop, but it never can be made so definite—you cannot get so much attack, the sound is not so precise or hard, as it is higher in the scale. Therefore, the remark that the lower notes have not the same effect of attack as those more within the ordinary range of compass is not against the instrument going down so low as that. I do not think it would be possible to get the low *B* on the double bass sounded with the same definiteness and point of attack as the *G* a trill above.

Mr. WARR.—Our ears require some time to take it in.

Mr. SWEETMAN.—Sometimes, in listening to a 32-ft. tone, even with my faculty of pitch, I had a difficulty in determining it unless I hear the octave. It is not a reproach against the instrument which produces it, but against the gravity of the sound. As you rise in the scale, so the vibrations increase exactly two to one for every successive octave, and the more vibrations, the more definite and the more piercing the note.

The CHAIRMAN.—It is quite clear that a good deal of what is supposed to be the indistinctness, or want of attack, comes from the slowness of our hearing. It is with the ear, like the *eyesight*, movement may be so rapid that the *eye* cannot perceive it. Again with the lower notes, to a certain point you can hear the note distinctly, but if we get much below that we are not able to say what the note is at all without the octave above being sounded along with it—we are all agreed on that. So with the higher instruments, the flute or violin, the harmonics might go so high at least that we would defy anyone to say what the real note was, although it would be there. I think the fact which has been mentioned, that the lower note has not the same attack, and is not quite so definite, comes from the fact that our hearing is not quite so acute as that of some other people. But in orchestral works it is quite clear that that low *D* is of the very utmost importance, for to have a passage inverted and turned upside down, making a sort of backgammon in the middle of a symphony, is very absurd, and the *D* is wanted very frequently. But I do think with Mr. Matthews that it should be specially studied; probably it needs a wide bridge, such as Mr. White has got, and possibly also a little larger finger-board.

Mr. SWEETMAN.—Did I understand Mr. White to say that there was an instance known of the Jews using a bow? I have not met with that statement before, and I should like to ask his authority for it.

Mr. WARR.—I read it in Mr. Hart's book, "*The Early History of the Violin*."

**THE CAUSALMAN.**—There are instances of the bow being found in Egyptian works, and probably, if the Egyptians had it, the Hebrews would have it from them. It is a curious fact that although we say this is the grandfather and progenitor of all stringed instruments, I have no recollection, in any ancient Cathedral, of seeing any sculptured Cherubim playing double basses, although there are many with violins. There is another interesting point which Mr White did not touch upon, probably Mr. Hart's book does not go so far back as that. There is a much finer book than Hart's, by M. Vidal, a superb book on stringed instruments, in three volumes. There must have been a progenitor of the double bass, and that was a one-stringed instrument—a monochord—and such an instrument is still in existence in the Cathedral at Basel, which clearly was used in the service as a musical instrument; an instrument with one string, much longer than this.

**MR. SCHNEIDER.**—At Ulm Cathedral, in Wurttemberg, I saw three or four of these monochords, and I asked the question whether they were used for the service, or what they were for; the answer was that they were used forty or fifty years ago to start the plain-song and support the voices of the singers.

The vote of thanks to Mr. White was then carried unanimously.

On the motion of Mr. G. A. Osborne, a similar compliment was paid to the Chairman.

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MAY 4, 1917

MR. CHAS. E. STEPHENS

IN THE CHAIR.

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ON CERTAIN NOVEL ASPECTS OF HARMONY.

By EUSTACE J. BREAKEFELD.

MELODY and HARMONY in music are commonly held to be two distinct provinces. Strictly, however, the precise shares of the harmonic and melodic elements of the art are hardly to be separately evaluated, inasmuch that a musical strain, even unaccompanied by supporting harmonies, has its underlying chord-structure, which the mental ear recognises and adds to the impression. All affecting such things as scales, keys, modulations, is essentially dependent upon a rightful apprehension of the harmonic relationship of sounds, and all questions raised thereupon pre-suppose the latter to a greater extent than is commonly imagined. Even the simplest melody contains its harmonic support, and the same, whether we are conscious of it or not, enters into the total impression of the strain. That most elementary of æsthetic principles in music—the antithesis of *concord* and *discord*—reposes upon this harmonic element. But, apart from this, the technical distribution and ordering of chords, from the simplest of consonances up to the most complex of *dissonant* combinations, at the same time that it calls for a certain differentiation of the study, requires a scientific or theoretic basis of the most accurate kind. However free the art may be, on the whole, from theoretical control, there is yet no doubt that in this special department a wrongful theory may detrimentally influence the material, and through it, consequently, the technicalities and practice of the art.

The question is frequently raised, "How far may science be claimed to have the right to direct the practical steps of art?" To what extent are the empirical methods in art justified? Is science throughout relegated the task of coming in afterwards with its explanations and proofs, or may it be looked to for light in advance? In my opinion there comes a point at which science must cease and give place to the free, artistic selection—to the instinct, intuition,

or what we may term it—of the musician. Let us do my best to make understood one or two of these points, in connection with our present subject, as I view them.

If we refer to the oft-discussed music of the Greeks, we find here a decided instance of science determining prejudicially the development of the art, or, rather, I should say, fatally determining the ultimate arrest of that art. It is well understood how their "mathematical" measurements by perfect fifths resulted in the most painfully complex of musical systems. Like as in other arts, we find in music the natural elements before us; but it is in the work of selection from among these that just the difficulty lies. This may seem a truism, but I contend it is overlooked by those who imagine they have settled the question decisively in the finding of some natural principle which may accord with the facts already before them. How often has argument been raised upon the question, "Is our scale system presented to us in nature, or is it man's own invention?" They who argue that the same is nature's own model mistake, in my thinking, that we which has become a "second nature." It ought not to be difficult to perceive that a selection may be made after a part-arbitrary, part-inuitive manner, as I take our present system to have been, and yet all the time the process and results to be in conformity with natural laws. It is thus possible that even widely divergent systems might equally be justified in natural science. What some cannot be made to understand is, how a system may be both accordant with natural laws and yet so accurately to exist for precisely this and no other having been arrived at. The history of our art shows us that, for the greater part, the evolutionary process of scale formation has been one of gradual, tentative, experimental effort on the part of the artist; that, just in those instances when scientific deliberation has preceded and governed the artistic choice—as we find it to have been in the case of the Greeks—the results, however perfect and satisfactory from the one aspect, have little benefited art, to say the least. This is not to say that science may not throw much valuable light upon the methods of the artist—by no means. We have simply to bear in mind that the regard of art with science is a very delicate and critical one, and that it behoves the worker to be careful that no wrong leads are suggested or false inferences presented, through some mistaken interference of science with art, outside its own specific boundary. In its own province science must rigidly prosecute its own methods; its examination of the physical side of art-phenomena is not to be interfered with, nor its results to be challenged; but, on the other hand, the musician—whether intuitively or with full conscious deliberation—is to be left free to "pick

and choose," if I may so term it, according to his own specific requirements. I will now endeavour to adduce some practical illustration of my so far abstract argument.

Had there been time I should have liked to trace the gradual growth of our present musical system; where the unfortunate mistakes had occurred—all the tale, indeed, of an almost blind groping after a safe and certain foundation for the art. I take there to be no more interesting study than this of the slow evolution of our pre-ent working elements in art. When we come to reflect that it was but two years ago that our twin major and minor modes at last asserted themselves from among the other artificial scale systems of the early Christian and mediæval ages; that, again, it was equally late in the day before the existing interval ratios of the scale became definitely settled\*—thanks to such pioneers as the early scientists Monodius and Zarlinus—no wonder, it seems to us, that music should be the "infant" among the arts. As to any properly theoretical knowledge of the laws regulating the disposition of notes in harmony, this was to come even much later still. As we all know, the first elementary definition of the simple "common chord," about the third or fourth decade of the last century, marked an important era in the history of musical science, and stamped Rameau as a mighty innovator.

Now it is just at this point where I should like to attach my moral. We have found that the elements of our modern art have been definitely brought into shape without much prior enlightenment from purely scientific research; that what there has been of scientific interference has in some instances proved most misleading—for I take it that if the Greek world possessed no "harmony," in anything like the proper sense of the term, it was owing to the fatal application of scientific assumptions. The question so often debated, whether harmony did or did not exist among the Greeks, may be disposed of by a simple reference to their impossible third. It is true that we—as some of us—at this day, might question whether two notes standing in the ratio 8: 9 does

\* Very fully, and, I might say, upon this point in musical history, we learn that, in the decisive period of the Greek æra, the old mathematical systems, as I have termed them, were on quite as favour of a certain sliding "variable" scale; that the admission of *Diapente* and *Pythys* did manage to "fix upon" the true ratios of the major and minor thirds, along with that of the major seventh, and, in fact, presented system scales differing only from the modern upon the mere point of ordering of these ratios; but what the general system of note measurement was, during the early Christian æra, when the already double Greek modes had become restricted for church use—whether the recommendations of *Diapente* and *Pythys* were in any way followed out, or whether the old mathematical Greek ratios also obtained—the student simply left unconfused. Though most careful disquisitions of the different ecclesiastical modes are made, yet this important point is passed over as of no claim to mention.



indeed make such a cacophonous combination as to be altogether "impossible." But there is no doubt that the Greek scientists would condemn such, *a priori*, for the simple reason of its retail complexity, without any appeal to the ear. Their writer, Aristoxenus, seems to have been the first to enunciate the dictum that music was, after all, a thing for the ear, to be judged and discriminated of by that organ, rather than a subject for arithmetical calculations. Which teaching, of course, excited much hot opposition. I have no need to dwell longer upon the music of the ancients. I simply refer to the Greeks and their art in order to draw a certain lesson therefrom, for we shall find that very similar conditions present themselves, again at this present time, to those which disturbed the elegant musical Athenians of old—another illustration of the backwired adage, as to "nothing new" being "under the sun."

Much about the same time that musicians had begun to account theoretically for their chord combinations, scientists chanced also upon the discovery of certain laws in nature affecting the elementary musical material—that is to say, sound—*itself*. The efforts of Tartini, Sorge, among others, might almost be taken to mark a temporal division between the antique and modern in music, between the empirical and theorized in musical teaching. The theorizing of Rameau was restricted mainly to the simple triads, but the importance of even this advance for the time can hardly be overrated. Musical composition was undergoing a transformation from what has been styled the "horizontal" (that is to say, contrapuntal) into the modern "vertical" method. Instead of viewing a certain number of notes as accidentally touching, the total combination was now conceived of as a "chord." We find it difficult now to convey ourselves, even imaginatively, back into the spirit of a period when there was absolutely no conception of a harmonic unit, when all that held notes together in simultaneous sounding were certain empirical, cut-and-dried, contrapuntal *formule*, along with a certain antiquary method of combining the melodically independent parts of the score. The scientific rules the youngest pupil assigns to himself now, at the first lesson, were, as I say, astounding and revolutionary discoveries in 1735. We are only too apt to judge the phenomena of art from our present standpoint, bringing to bear the results of a lifetime of theoretical learning upon the work of a "rule of thumb" period.

In passing, I may refer to a certain misunderstanding of terms which seems to be very general. That is, as to what is properly a "theory" of music, and, more particularly, a theory of "harmony." I have seen a "theory of music" advertised which was nothing but a children's primer

of musical notation. Likewise the many "theories of harmony," when examined, come to resolve themselves into a collection of technical hints—for they are little more—as to the recognised methods in the way of forming, introducing, and resolving, the different varieties of chord tabulated. The student is informed wherein consists the difference between a "discord" and a "concord"—i.e., what particular combination of notes go to make the one, what the other; but how they actually come to be discord and concord, in the first place, nothing is said. Probably it is held that such information would be too abstract and out of place. I know no other study wherein the mere tabulation of the materials—and the dogmatic style of reply as to their employment—would be so naïvely accepted for scientific theory as in the instance of the musical. The outcome of all this is, that they who have secured empirical results in this take-it-all-for-granted style—who have accepted the mere hasty generalisations of practical effort as scientifically proven axioms—turn the most bigoted ear to any suspicion of a want of accuracy in that doctrine upon which they themselves have been fed, under the belief, all the while—poor, ridiculous mortals!—that they are thus defending the right Conservative policy, the true and only scientific "theory."

It must, of course, seem perfectly absurd to any student who has never examined more closely than this into the fundamental grounds of his belief, to have such questions posed as: "Why does your 'dominant seventh' have to descend—the whole chord, indeed, require to descend, upon a concord?" "How is it that the seventh is a discord, when a minor and major are consonants?" "How comes the limit of consonance to be drawn in the one place rather than in the other; at the minor third, rather than at the harmonic ratio 7:6, or elsewhere?" These questions, I have found by experience, to have much the same effect as your properly graduated musical student as would the question, "Why does the sun shine?" or "Why does the earth revolve round the sun?" All such points upon which you try to raise argument are held to appertain to "first principles," it being impossible to get at any reason beyond.

Now, it seems to have been fated that ever since there became such a thing as "harmony," the strictly scientific appreciation of musical elements should, in the main, be kept distinct from the academical treatises, and put in the very place, unfortunately, where scientific indifference was sought, it became fated that musical theory, like that of the ancient Greeks, should take a woefully false step. Only recently have theorists commenced to make their foundations a little deeper; nevertheless there remains, as I said at first, certain critical points upon which alone

the artistic choice is permitted—whereupon pure science is ineffectual. I presume such a treatise as that of Gottfried Weber might be proffered as example of the old empirical style of musical didactic writing. On the other hand, certain of the more scientific modern systems fail in not practically applying their teaching; that is to say, there is none or little working out, in technical shape, of the theories started. It was, as before said, a new era for musical theory when the natural laws of sound, especially that respecting "harmonics," became either discovered or better understood. Certain chords were seen to coincide with the harmonic series; that each single note acoustically contained within itself a whole triad. Here was, then, the natural justification for the musical scale and harmonies in vogue. So far, so good. But, unfortunately, the wrongful inference was drawn that, since the harmonics agreed with the recorded combination, they also afforded a reason for the artificial, "dissonant" combinations. The acoustical law, under which a vibrating string ever divides itself into an increasing number of sections, in strict arithmetical order, was now assumed to offer the source or model of all the more extreme musical combinations. This assumption, which seems to have been quickly and ungenerously made, and possibly for that reason all the more strongly imposed itself, I account to have been one of the most lamentably mistaken of all mistakes in or to do with art. It may not have had quite such fatal practical consequences as did the mistaken computations of Greek science, for the reason that the present scale systems had already been definitely fixed, in advance this time of the scientific element.

The common chord *C E G* is found, then, to be identical with the primary upper "partials" of a generating root *C*. Had they not proved identical I hardly fancy the harmonic theory could have been sustained. But having a start upon the triad, the theory rides amply and gaily over any inconsistencies and discrepancies farther to be met with. Had any chord of four distinct sounds, say *g, b, d, f*, likewise agreed with the harmonic table, then there would have been still further proof afforded of an underlying and inevitable natural law. But, beyond the first elementary triad, there was no agreement or identity—though an escape has been made for this, in saying that the exigencies of "equal temperament" render the fourth note out of keeping with the actual harmonic, but that the ear must theoretically accept it for the true seventh, to which illusion the ear will accommodatingly lend itself. It is unfortunate that the question of chord derivation has been thus confused with that of "temperament"; and this, again, with that of a total reconstruction of the scale. Even some advanced

scientific writers seem to mistake the one question for the other. Our scales, and their interval ratios, have been adjusted after the well known order; any dispute hereupon is quite apart from questions concerning tuning and "temperament." In short, there is the theoretical scale, which is to be held as wholly unaffected by the practical exigencies of the keyboard; and, in any question of theory, we cannot escape any falsity by pleading a more practical compromise. This is simply throwing dust into the student's eyes.

Mr. Chappell, for instance, in his "History of Music," would have us introduce the true harmonic  $F\sharp$  and  $B\flat$ , while sacrificing our present  $F$  and  $B$ , since they are rather harmonies of the lower  $F$  than of the tonic itself,  $C$ . That is, he goes upon the assumption that all the intervals of a scale should be harmonies of the tonic. Whether such intervals would all then coincide he doesn't say; if some are to be discords, where, as I said before, is the distinction to be drawn; and, above all, what should impel a natural harmonic so strongly toward "resolution"? Nature, we know, never resolves any of her harmonies. Mistaken pretensions of this kind tend to affect and influence scientific speculations themselves. I presume that most musical scientists, by this time, have become imbued with the notion that the harmonic seventh and its resolution in music is a proved fact; and their future speculations would base themselves upon this assumption. Thus, we have perfected instruments in which the  $C-B\flat$  is made to correspond with the harmonic seventh ( $7:5$ ); it is found "sweeter in quality" than the ordinary seventh ( $9:5$ ), this perhaps ascribed to it as a virtue, and no question raised again as to why a harmonic  $7$  should either call for resolution, or, indeed, be classed among discords at all.

I have done my best to make clear that nature neither imposes dominant sevenths nor any other chords, for that matter, upon us; it is left to our free discrimination, or artistic perception, whether we choose this or that ratio for our scale. Then, the notion of a natural harmonic combination of  $1$ ,  $III$ ,  $V$ ,  $VII$  (that is root, second, fourth, and sixth "partials") forming a chord. Well and good. What is to follow? "Oh, the 'resolution' of the chord." "But, stay—why should  $g$  &  $d$  be consonance; the  $f$  simply added turns it into dissonance?" The reply is, that the limit of consonance is drawn at the fifth and fourth harmonics in combination—the minor third, namely; while the sixth and fifth (and consequently the whole chord in which they enter) stand upon the other side of the border. But why so, we repeat; how is it decided that the line is drawn precisely at this place?

No reply we get, except perhaps an intimation that the interval gets too small here to be consonant. But, again we urge, was not the minor 3rd at one time similarly taboored; and did not the Greeks exclude, as being too complex, all ratios higher than  $4:3$ . It resolves itself, after all, into a question of degree rather than of kind. The only perfect concord, in a sense, is the octave, whose ratio is  $2:1$ ; all other intervals imply vibrational opposition; even the fifth is a discord in this sense; the minor third is thus one degree more complex than the major, and the lesser ratio  $7:6$  just one remove further than the minor third.

The German writer, Kuder, defines "Harmony" as unity, and "Discord" or "disharmony" as "the expression of the loss of this unity, and the striving after the restoration of the same." Objectively considered, discords (I take it) result from the combinations of chords, or parts of the same, having different roots; and the resolution is the progression towards the nearest, or most convenient sounds, having common connection with the opposing elements.

It is my earnest desire to elicit some definite opinion upon the points here offered. The "novelty" of the theory propounded by the authors, whom I will name, is not such in the sense of their being absolutely brand new; rather, in the sense that their ideas, though they may have been current elsewhere for some time, have yet, however, secured little attention at home. The first writer, as far as I am aware, to break the conventional bonds was Moritz Hauptmann. Whether his work is read by musicians or not, I cannot say; certainly I find it very little discussed or even referred to. I may say that the "*Music u. Harmonik*," after I had overcome the rather formidable style of the author, appeared to me as a perfect masterpiece of artistic perception—in its own way as precious to the art as the "*Wohltemperiertes Clavier*" of Bach. It would take me too long to explain every point of what may be termed the Hauptmann theory of chords. I may at least convey the main ideas. Hauptmann holds that musical discord results from the conflict of opposing spheres or ranges of harmony. The harmonic cell is the triad—root, third, and fifth. An infinite extension of these triads is possible in either direction, the upper element of the one being identical with the base of the other, and vice versa. Any chord out of this infinite range selected for central or tonic, will have its positive removes on the one hand—the chords which are generated from the tonic; on the other hand, the negative removes, or those from which the tonic itself springs. In this way we get both minor and major systems, the minor third being viewed as the upper third from the upper note of the triad; the minor chord thus being a



assuming that the elements of the chord all pertain to one and the same harmonic series—nor even in what renders the distinction between consonance and dissonance.

I may just complete this sketch of the Hauptmann system with one or two further particulars. Our author finds that certain of the major chords are combinable with minor in one and the same system. [Let us understand by "system," in this sense, a certain compass of three triads out of the infinite range—say to the limit of two semitones, Positive and Negative, on each hand of any fixed tonic.]

Thus, a major tonic chord with minor negative chord—



This forms the harmonic basis of a certain hybrid form of scale, which Hauptmann terms the "*Moll-Dur-Tonart*" (major minor scale), having as its peculiar intervals a major third with a minor sixth—



On the other hand, a minor tonic chord conditions always the major positive chord—since a minor chord on the dominant would be unfitted for resolution upon the tonic; at the same time, there is nothing forbidding the employment, otherwise, of a minor triad on the dominant, in minor keys.

Hauptmann stays here at the definition of the dominant seventh, and its various forms of inversion and resolution. I account the apparent lack of enquiry into his system to be owing to the philosophical abstruseness of his style of writing, he having tried to incorporate Hegel's theory of the "identity of contraries" with his system. The various relative aspects of dominant, tonic, and subdominant chords peculiarly favoured this sort of treatment. Though at first very forbidding to the student, he finds that, after all, the actual propositions themselves are simple and logical enough.\*

It will be perceived how these simple principles allow of development and systematic expansion. For example, under the same conditions which determine the entrance of the first

\* I should mention that a simplified version of this portion of his work treating upon harmony (that upon rhythm being quite different) has been published since the author's death, simplified and edited by Dr. Oscar Paul. Leipzig: Breitkopf & Härtel—1911.

positive and negative removes, so do the second removes enter into combination—



Here we have the triad of the second degree of remove in combination with one element (C) of the tonic chord. This discord, which we have commonly styled "the super-tonic 7th," is resolvable either directly upon the tonic or upon the intermediate combination (P. I. with N. I.)

Mr. Parkinson, the author of the "Natural Principles of Harmony," curiously reproduced Hauptmann's theory, without being acquainted with the fact, I believe. Unfortunately, in this instance again, the treatment of a very simple theory was made so scintillatingly abstruse as, coupled with the high price of the book, to render the sale of the later very limited, I fear. The critics dismissed it as one among the many "faddy" theories upon this subject. If aught I can say will tend to excite better interest in this clever work, I shall be delighted.

Mr. C. E. Stephens (our present worthy chairman) who, we all know, has busied himself very greatly with this subject of harmonic theory, has also put forward, from time to time, certain propositions and suggestions in respect to the origin of these "mixed chords" which, it appeared to me, were very similar to those made by Hauptmann and again by Mr. Parkinson. I shall be glad to learn how far Mr. Stephens feels inclined to support the views already expressed.

In further completion of the musical "system" developed in the way described, it ought to be explained that each (configural) couple of the primary concord originates also a "secondary" chord, through a selection of the inner sounds. Thus:—





Here the major triads form minor "secondaries" between them, and vice versa!—



the minor primary chords give rise to major secondary chords.

The distinction should be well drawn between certain accidental (chromatic) elevations or depressions—in agreement with a law of melodic progression—which occur in some independent part, but which affect, so to speak, the whole chord harmonically—between such, and the true, unaltered components of other triads in combination—e.g., in the chord *G, B, D $\sharp$* , the sharpened *D* must be explained as the simple melodic plying upward of the natural *D* towards its ultimate *E*. This combination must not be confused with the possible chord *G, B, E $\flat$* —wherein the *E $\flat$*  enters as the essential prime, third, or fifth of some other triad in combination with that of *G*; nor is the notation of these notes an indifferent matter. This melodic interference, so to call it, with the harmonic elements accounts for much that has long puzzled the musical theorist.

Only recently has the harmonic element in music become cultivated with especial regard to its expressional significance. The older writers employed harmony rather in decorative purpose, so we might term it. In Mozart, and later on, still more perfectly in Schubert, a definite psychological meaning becomes attached to the harmonic side of their music; and, moreover, chords are employed in a more independent sense and value. Certain writers show a comparative poverty of invention in the handling and treatment of chords, while others, more attracted by this element, tend perhaps to exaggeration even in their continual devices of chromatic harmony. Likewise, a similar contrast can be noticed among futurists; while some are satisfied, alone, by a pleasing melody—almost unconscious, indeed, of any other musical ingredient being present—others will take an extreme, and equally one-sided pleasure in the composer's artful revolutions and devices of harmony and modulation. I am bound to say, however, that the latter are very much in the minority. The Italian people, on the whole, are noted for their deficient sense of the beauties of harmony; the simple

fundamental triads, and a few of the attendant minor chords of the key, with the different "inversions" of them; the "dominant seventh," along with several of the more melodramatic "diminished" of the same species, these, with certain conventional "passages" in thirds or sixths, making up the stock harmonic material of the typical old Italian opera.

Each independent chord conveys its own definite mathematical impression, impossible though it be to translate the same into words. All combinations containing chromatic elevations—e.g., the "augmented fifth"—may be said to convey the feeling of forward-striving; but it would be absurd to attempt to describe each harmonic combination after this manner. Again, each "inversion" of the same dissonant or consonant group differs, by some subtle aesthetic sense, from the others; compare, e.g., the wildly-pungent  $\begin{smallmatrix} 5 \\ 3 \end{smallmatrix}$  with the softer, more insinuating  $\begin{smallmatrix} 3 \\ 5 \end{smallmatrix}$ . Then, again, the same  $\begin{smallmatrix} 3 \\ 5 \end{smallmatrix}$  chord, or inversion of chord, will differ according to its various aspects or situations towards the tonic—that is to say, a "chord of the sixth" on the dominant will sound a much different thing to the same inversion upon the subdominant. To such who may object to my own "impressions" of the above chords, as not agreeing with theirs, let me remind that the question of the definiteness of aesthetic characteristics in music is not determined by the success, or otherwise, of any attempt at interpreting the same: this is the sense so often forgotten. The *authentic* of all art elements and their combinations we must assume to be invariably the same. How each may explain his own impression is quite another matter.

## DISCUSSION.

THE CHAIRMAN.—Ladies and Gentlemen, I am sure that you will agree with me that our first duty is to pass a vote of thanks to Mr. Breakspere for the lecture he has kindly read to us on this occasion.

(The vote of thanks was carried unanimously.)

THE CHAIRMAN.—As no one has risen in answer to our lecturer's invitation to discuss the paper, I may say that it is perfectly true that I have thought much on this subject, and in a lecture which I read some years ago here, adverse to the theory of Dr. Day. I promulgated to a certain extent a system of my own, which I am positively startled to-day by finding is almost identical with that published some years ago by Hemptmann. Mr. Breakspere said that it had not made its way, and probably a great many musicians had not

heard of it. I confess to not having done so myself, but there is a startling coincidence in the principles upon which he starts. I think it must be borne in mind that in the selection of harmonics for a theory, we must impose a limit upon ourselves. Mr. Breakspere only went as far as the seventh and said that is not a discord, nor should it be called a discord, when the sixth, which is also a product of the same note, is not called a discord. He might have gone much farther, the harmonics do not stop at the seventh, the ninth, the eleventh, or any number, they are absolutely infinite, and consequently a process of selection must take place. In my theory, which is identified with that of Dr. Hauptmann, I stop at the very interval which gives us all this trouble, that is the harmonic seventh, that is to say, I make that my barrier, and do not use it, I adopt simply the three notes which form the triad, which, as everyone must feel, are the elements of our chord system. Given then C, E, G, or rather I will take the dominant chord, G, B, D, is the key of G major, we are told when you add F it is a discord, but if that discord be derived from the same root as the fifth, there is no reason why it should be a discord any more than the fifth. I believe that is your argument, Mr. Breakspere? Mr. BREAKSPERE.—Exactly.

The CHAIRMAN.—But suppose it is derived from another root, a subdominant root instead of the dominant, and superposed, as Mr. Breakspere has shown us, you have a reason for calling it a discord, because it is a note borrowed from another root. My theory is a very simple one indeed. The subdominant, as it is very properly called, implies a governing note below the key note; that I hold to be the key of C to be F; F, A, C gives a triad below, then C, E, G, and the next superposed triad is G, B, D. Now all those notes are derivable from the lowest, and as they rise in this manner, so I maintain they are capable of being used in combination. Now the Day theory, I must do it the credit of saying, is one of the few in which a serious attempt is made to account for the difficulties of musical theory, but some chords it does not deal with at all; for instance, the chord of the eleventh on the subdominant, thus, F, A, C, E, G, B. I give the chord in its entirety; but eliminating the warning elements of that chord, you have a chord that is not provided for at all in the Day theory. I call that chord the eleventh on the subdominant! it is a very beautiful chord, provided, by the derivation I have assumed, from the subdominant, with the tonic as the centre, and the superdominant or overdominant of the key. Another further argument in support of my view is this, a dominant chord followed by a tonic chord is not thoroughly indicative of a key. If you play a chord of C, followed by a chord of G, no one shall say

that it is in the key of C more than in the key of G, it may be either one or the other; but the moment you add the remove on the other side—and I think the word is a very good one, it is my own word—the moment you have the note that forms the distinctive characteristic of the chord on the other side that is indicative, and you immediately have a note which determines the key. It is those three chords, which can positively determine the tonality of the key; if you have C followed by G, it may be in G, or it may be in C ending on the dominant; but the moment you incorporate with it only one note of the subdominant chord, it immediately fixes the tonality. I think it only just, although I so widely differ from Dr. Day's theory, to say that he must have devoted considerable attention and considerable thought, and a great amount of skill to it; it has commended itself to the notice of our very distinguished musician Sir George Macfarren, and, therefore, there must be something in it, but I have yet to learn to appreciate it as he does. Nevertheless, I look upon it as an earnest endeavour to carry out what was never thoroughly done in this country, or, to my knowledge, in any other. The other theory, that to which Mr. Broadbent alluded, was that of Parkinson, a music-seller of Manchester, which I really think is one of the clearest books of the kind that I ever saw. He proceeded on somewhat different lines, but in the main he takes some of the views that Mr. Broadbent has shown as being used by Hauptmann. When I heard Mr. Broadbent today I was tempted to ask him at what period this work of Hauptmann was published, and was endeavouring to persuade myself that possibly my ideas had somehow got abroad and had been adopted, for the startling coincidence between the views I promulgated, as I have already observed, was most extraordinary. I have endeavoured very imperfectly to show you how I coincide with these views with regard to the derivation of minor thirds, which is one of the crucial points in music. I have to thank you very much for the kindness with which you have listened to me; I feel very proud that so eminent an authority should have corroborated the views which I myself have entertained without knowing that he had come to similar conclusions.

Dr. VISCONTI.—May I ask if it is absolutely necessary to have a theory in the present state of music? In the present state of our tempered scale is it not quite enough to know the scale as we have it, and from that scale to build the necessary combinations which all great composers tell us are acceptable to them?

The CHAIRMAN.—My answer to that would be simply this, I think we ought to have some reason for the faith that is in us, and when you say "taking the scale as you find it," that

is a purely empirical view of the whole affair, because anyone appealing to you on the subject might turn round and say, oh, the scale might have been anything else but what it is. Now, the derivation that I have shown you here gives the identical scale precisely as it exists for our use, thereby proving that nature and our scale are not at discord with each other. I think if Dr. Vincent's views were carried out it would result in this, that every one would invent his own scale, and compose in it as he pleased, that could hardly be considered satisfactory. I think Dr. Vincent will admit that nature gives us so much of our present scale—as I have said, it gives us the whole of it, it gives us the intervals that we use, and I think it would be unsafe to dissent so great a guide as nature herself.

Dr. VINCENT.—I might add one remark which I forgot. The first theory of music—the first book on music that I studied theoretically was a German system, in which there were nine notes in the scale—a sharp fourth being added.

The CHAIRMAN.—Was that in the minor?

Dr. VINCENT.—No, in the major, the sharp fourth treated as an ordinary scale note. In that scale every possible harmony can be accounted for with great ease; that is to say, that you can take a scale, and from it account for every harmony with ease, for the practical purposes of teaching harmony, for writing, and for thinking of it. Of course I know it is outside of the question as to deriving a theory from nature, and, therefore, I feel that my remarks are not quite in order.

The CHAIRMAN.—You are speaking of the Abbé Vogler's system, I think.

Mr. SEYMOUR.—One would like to have Mr. Stephen's opinion, as an authority who is very widely respected, as to whether there is really any fault in the system of notation, or rather of the notes of the scale as we have them now, for it seems to me that, after all, the scale, with its semitonal divisions, has been gradually built up. I take it, it was not so originally; these subdivisions were gradually added. One knows that practically at the present time there are minute divisions which are made by violinists and persons who play on stringed instruments with regard to D sharp and E flat which are not made on keyed instruments, but with which nevertheless we are quite satisfied. Is it not possible that we might go on using those intervals, accompanying them by others, or new or modified harmonies, if that be the case, the scale, as it exists at present, and the number of notes in it, will no longer be complete for the purpose of music? In that event, I take it, they can hardly be derived from the vibrating string, because the intervals are not quite accurate with any mathematical division that we choose

to make of them. Is it not possible then that those who hear them will gradually become attuned to these new intervals, and like them just the same as we hear with pleasure intervals and chords that our forefathers could not possibly have been satisfied with?

Mr. HANAUERMAN.—I beg to suggest that all intervals, however minute, must accord with some section of a string in vibration.

The CHAIRMAN.—The difficulty in answering Mr. Southgate's question is this, if we pursue it to its logical conclusion, it is really the adoption of anything you please, as I said before. Instead of that I feel that our major and minor thirds are all derived from nature, and although the D sharp and E flat may be found to be different in pitch, of course that is really the case, and these two intervals doubtless may really be used in just intonation; but the compromise of equal temperament is certainly a very useful one, and even violinists who are able to play any pitch they please for a note—I think even to them it is a great boon, because if they do not play E flat and D sharp pretty nearly the same, they would require the bass part as well as the melody to know the root they were playing from. It has been claimed for some that they do make a difference, but really to make this difference exact they would require to have the root presented to them at the same time, and that you know would be utterly impossible, or, if it were possible, would add complications in the way of the artist.

Mr. SOUTHGATE.—It may be remembered that Colonel Thompson, in his organ, endeavoured to do that, he had some forty notes in the octave, which he maintained gave just intonation; but I believe he found that a certain amount of compromise was still required; indeed, no perfect keyed instrument can be made.

Dr. VINCENT.—In the Hauptmann system, do you allow only one root to start from?

The CHAIRMAN.—No, three roots for each key.

Dr. VINCENT.—Where do you get the dominant key from? You have the tonic, but where do you get the subdominant root from?

Mr. HANAUERMAN.—The subdominant is the generator of the tonic.

Dr. VINCENT.—Then you begin a key in every tonic harmony from the subdominant root.

The CHAIRMAN.—I assume the tonic root, not the subdominant. You must take something to begin with.

Dr. VINCENT.—Assuming the tonic root, where do you get the subdominant from?

The CHAIRMAN.—In this way, in the key of C, the first triad is C, E, G, then from G I get G, B, D, then you get

to the extent of your resources in the same direction. Looking the other way, backwards as well as forwards, I get that which forms a similar combination below the central point, and so I supposed the root by its various relations.

Dr. VINCENT.—That is very interesting, but I do not think it is logical.

Mr. BRASSERMAN.—It is logical, because it is already existent. It is the principle which governs the formation of chords.

Dr. VINCENT.—Then I think my remarks were quite in order. If you are going to allow that view just because it is logical, because it already exists, I say our scale already exists, and from that you can derive everything.

Mr. BRASSERMAN.—It exists, but in what way?—as an artificial product? I view it as a natural, harmonically supported scale.

The CHAIRMAN.—Treat your *tonic* as the central point and surround it.

Dr. VINCENT.—I think there is a difficulty in getting the subdominant root naturally from tonic harmony.

Mr. BRASSERMAN.—I think, as no one else wishes to speak on the subject, I must, in the first place, return you my thanks for the kind attention with which you have listened to the paper. I am very gratified, of course, to find that Mr. Stephens bears out my remarks, and that the doctrine I have favoured coincides with his own. I do not think he need regret in any way having been anticipated by Hauptmann, for it is with this theory as with many others, perhaps they await practical fulfilment, and there is sufficient room now for some one—especially one who has the experience of Mr. Stephens—to form a perfect system. You may remember I, to some extent, anticipated that objection as to the practical non-agreement of a tonal system derived in this way from roots with a tempered system, in which are twelve equal semitones or, perhaps, still further minute divisions of the scale. I should have liked to explain myself on that point a little more, but I can only repeat, to some extent, what I have already said, that so long as we employ chords in combination we must furnish a reason of some sort for that combination. If you simply divide the extent of an octave into I do not care how many divisions, and you then proceed to combine the notes thus formed, you are just in the same predicament as before; you must have some system upon which you combine those notes. There still must be roots of chords. It seems to me that we need not go searching for the more difficult, while, to my mind at least, there lies at our door such a simple reason as this given for the scale and its formation. Mr. Stephens has explained, and I unfortunately omitted that point, that the three primary triads

of the tonic, subdominant, and dominant exactly furnish the notes of the scale, and that in both major and minor modes. I repeat, what need have we for imagining further difficulties which might arise with more minute divisions until we are obliged? Why should we assume those difficulties, as we still have to work under the present system? Let us, at any rate, be content to find some logical reason for the system at present in use. I have already argued that all questions of temperament have nothing at all to do with the question of the theoretical derivation of chords. I do not think there is anything more I can say. If that point has unfortunately not been sufficiently explained, I can only regret it, but I certainly did not think you would have any difficulty in accepting that statement—namely, that all difficulties connected with tuning and the equal division of the octave have nothing whatever to do with this system of chord writing.

Mr. SOUTHWICK then proposed a vote of thanks to the Chairman, which was carried unanimously.

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\* If our present scale is, indeed, actually founded upon a harmonic system, such as explained, any further extension of the scale material can only be possible in that direction, where these elementary harmonic principles shall still rule the same as before.—E. J. B.



JUNE 6, 1897.

A. H. D. PRENDERGAST, Esq.

OF THE CHAIR.

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*VOICE FIGURES, WITH ILLUSTRATIONS.\**

By MRS. WATTS HUGHES.

It is now about a century since acoustical figures were first brought to notice by Galucci, and they have been since then the subject of many interesting experiments by Savart, Faraday, and others.

As regards such results from vibrations produced by the voice, however, it is only comparatively recently that Professor Sedley Taylor succeeded, by his little apparatus, called the "Phonoscroscope," in showing upon the thin film of a soap-bubble stretched across the mouth of a one-inch tube the crispations produced by vocal impulses.

It was from observing the incoherent character of a soap-bubble as a vibrating elastic medium for the production and study of voice figures that the writer was led to try as substitutes a number of other media, with the result of finding that almost any closely woven and flexible material may be made to serve the purpose—e.g., calico, merino, silk, or satin, and in some cases, paper, while silver will show voice figures in steel remarkably well.

Considering, however, the delicacy of the forces by which voice figures are produced—viz., the impulses given to the vibrating disc by air thrusts set in motion by the vocal organs, it is clear that great flexibility is a most essential quality in any vibrating medium to be used, and after many trials, the best I have found is sheet india-rubber of the most flexible description. This material combines also the advantages of being waterproof, very durable, and allowing a wide range in the size of discs that can be formed from it.

Employing, then, as the vibrating medium very flexible sheet rubber, formed into discs by being tightly and evenly stretched over the mouths of receivers of various shapes and sizes, I have been able to produce, by means of the voice, a

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\* These illustrations were specimens of the voice figures. It is not practicable to give drawings of them here.

large variety of figures of several distinct classes, all, so far as I have been able to ascertain, new to science, and seeming to me suggestive of openings for further investigation.

Incidentally, I may say that in the course of these experiments in voice figures, I met with a very simple way of producing cohesion figures of great beauty, and possibly some artistic value; and although these are not produced by the voice, yet, as their production inevitably takes place in the course of the experiments to which this paper relates, and as some classes of the voice figures themselves are necessarily complicated by the co-existence of cohesion figures, I have taken leave to place some of these (but marked "cohesion") along with the specimens of voice figures, to which latter our attention is now to be specially directed.

The apparatus I have generally used is quite simple:—

1st. *A* receiver, open at top, and with an orifice below,

2nd. *A* piece of sheet rubber, stretched across the mouth of the receiver.

3rd. *A* tube, conveniently curved to allow vocal sounds to be introduced through it into the receiver by the orifice below the latter.

Sand, lycopodium, powdered colours, and liquids, such as water and milk, are among the substances which I have placed upon the discs, and have found to produce, under the influence of the voice, figures of various descriptions.

It may be convenient if I here classify these figures into groups, distinguishing them by different letters:—

Class *A* are figures formed by heavy powder such as sand, scattered upon the vibrating disc, and gathering itself upon the nodal lines of rest.

Class *B* are figures formed by light powder, such as lycopodium, gathering at the centres of motion, and leaving the nodal lines and their vicinity bare.

Of Class *B* there are two divisions:—

*B*<sub>1</sub>, when the lycopodium has been dropped upon the vibrating disc.

*B*<sub>2</sub>, when the lycopodium has been first spread evenly over the disc while at rest, then forming a thin coating, until upon vibration being excited by a vocal sound, the coating has been disturbed.

The figures marked *A B* are formed by a mixture of heavy and light powder—e.g., sand and lycopodium, and in these the sand marks the nodal lines, while the lycopodium seeks and shows the centres of motion.

Class *C* are figures in liquids. By placing liquids, such as water or milk, upon the rubber discs, and directing through the tube vocal notes of suitable pitch, and of not too great intensity, beautiful crepuscations will at once be ob-

served. A too intense note will cause the liquid to rise as spray so rapidly that its movements cannot readily be followed by the eye.

The denser the liquid, the easier it is to follow its movements, and the observation of such figures may also be facilitated by colouring the liquids used. Coloured glycerine, e.g., can be made to display beautiful effects.

As all liquid figures, however, are necessarily transient in their appearance, I do not attempt to exhibit any on this occasion.

Class D are figures in thickened liquids and pastes. The thickening of liquids to the consistency of a paste has the advantage of supplying a material at once sufficiently plastic to shape itself in conformity to the thrills imparted by the voice acting upon the disc whence it lies, and sufficiently cohesive to retain, if permitted to do so, whatever shape is given to it. In that material, therefore, interesting figures can not only be produced, but preserved.

Division D<sub>1</sub> of this class, are figures produced upon rubber discs simply in the way I have described, and belonging to this division is a variety I call "floral."

Division D<sub>2</sub> are impressions upon glass plates, transparent or opal, taken off the rubber discs while in vibration. In this division of figures every individual vibration of the discs may be seen recorded with great delicacy and beauty in undulating wave lines and forms. Belonging to this division are also two special varieties, which I may call "tree" and "fern," and it is to this division that I have alluded as being more or less complicated by the simultaneous action of cohesion between rubber, paste, and glass.

Recapitulating now, for a moment, it will be observed that, omitting the cohesion figures, we have here four classes of voice figures, A, B, C, and D, the first two shown by finely divided solid substances, heavy and light respectively; the second two by liquids, thin and paste respectively.

I would now beg attention for a few moments to certain points of interest in connection with these various classes of figures.

First, in connection with Class A, the sand figures, we may remark the striking variety of delicate patterns that are formed, and how they change instantly at certain intervals in accordance with alterations in the pitch of the note rung.

I have made some attempts to form a scale of figures of this class to correspond with the notes of the diatonic scale, but have hitherto found this to be impracticable upon a single disc, or in connection with a single key-note figure, as I find that in certain parts of the scale there are gaps in the chain of figures (I understand that with is also the case with Chladni's vibrating plate figures, caused to vibrate by a

violin bow). What may be the reason for these gaps seems to me an inviting subject for enquiry, as well as what would be a natural scale, supposing such to consist of the notes successively indicated by the spontaneous appearance upon the vibrating disc of definite and regular diagrams during the singing of an entire chromatic scale.

It is easy to see, however, that the sets of figures to be obtained necessarily vary to some extent with the shape and the tension of the discs, and by employing more than one disc, and thus obtaining more than one incomplete set of figures from which to select, I have been able to make up one set, which I show here, and which is so far complete that it contains one figure produced by each note of the diatonic scale.

Interesting though it might be to give a full explanation of the sets of figures most frequently found, their relations to their different key-note figures and to each other, and the remarkable ways in which their changes of form are effected, I am quite precluded from attempting this by the necessary limits to the length of this paper.

I will just say that the re-appearance of the same figure, as the effect of the repetition of the same note, may be easily tested by touching the centre of the disc, struck with a little cord, with a powerfully vibrating tuning-fork of the same pitch as the note sung, when a figure of the same pattern will at once appear.

Once, therefore, that the key-note and regular succession of figures pertaining to any particular receiver and disc have been ascertained, these figures will constitute (provided the tension of the disc remains unchanged) an unfailing and most delicate ocular test of the pitch of the vocal notes sung into the apparatus, and of the steadiness and truth with which they are sustained.

The range of notes that will affect any one disc is but limited; some will be found too high, others too low to influence it, but by taking a number of discs of various sizes, a very large range can be dealt with altogether.

In size the discs I have used have varied from less than an inch in diameter to more than twenty-four inches, and there would be little difficulty in employing discs even smaller or larger. The figures generally increase in size as the size of the disc is increased, and in complexity as pitch rises. The simplest figure obtainable is that which results from the lowest note to which the particular receiver employed will respond.

The penetrating force developed by the vibrations of a note steadily sung with but ordinary intensity is greater than would perhaps readily be imagined, and verified by experiment. For instance, I have found it possible to produce a fairly

defined voice figure is sent by vibrations passed right through solid substances of very considerable thickness, among others a block of spar three or four inches thick, a book an inch thick, and the top of an ordinary marble mantelpiece.

Another point which seems worth notice is, that when notes have been sung with force, I have at times observed, together with the figures ordinarily appertaining to the notes sung, the appearance of additional curves and forms, which I am convinced, belong to overtones actually produced at the same time, although invisible even to a well-trained ear. If so, it is a striking illustration of the sensitiveness of this apparatus as a test for musical sounds, revealing in these cases to the eye what the ear itself is incapable of detecting.

Passing now to *Class B*, the lycopodium figures, may I repeat attention to the appearances presented by these figures fixed in the act of changing between some of their definite arrangements, and also to the peculiarity that while in some cases the changes are made to an angle of nearly degrees from the previous position, in others they change by forty-five degrees only.



In this class of figures also can be seen very clearly illustrated what I have said as to the increase of complexity accompanying a rise in pitch. I have found—*e.g.*, upon various discs and with an ascending series of notes—the number of centres of motion to rise successively from 3 to 5, 7, 9, 11, 13, 15 and upwards. The figure exhibiting 15 centres is usually a very clearly defined one, and it has indicated a note sung of a tenth interval from the fundamental.

During the course of these experiments, I have had to employ vocal sounds in a great number of differing degrees of intensity, varying from such as would be inaudible at a few yards' distance, to others producing vibrations powerful enough to lift a glass plate a foot square when lying upon the disc, and I have been much struck with the marked differences shown as the results of the various intensities.

It has, therefore, I may say, occurred to me that seeing we have rather with the eye differences so material resulting from variations in intensity in degrees that have not hitherto been deemed worthy of any special notice in connection with singing, it might be well that both the voice and the ear should be trained to greater precision in regard to this matter of intensity.

I may specially instance the very different results of (1) coming suddenly from singing when sustaining a loud note, and (2) of letting the note die off *diminuendo*. In the former case, the cloud of lycopodium previously hanging in vibration over the disc simply drops flat upon it, while in the latter it becomes separated into a large number of small but beautifully regular dome shaped *coronae*.

In connection with this and the preceding class of figures, I am obliged to notice an interference with the experiments, to which I have been frequently exposed, and that arises, I think, from the development by friction of electrical attraction between the discs and the light powder strewn upon them, which attraction of course prevents the free formation of voice figures.

To vocalists it is, I think, a point of special interest that, in these experiments, when singing through the tube into the receiver, it is by no means every note that permits itself to be sustained with ease. Certain notes, so to speak, suit each bell. Singing these notes one feels just the same ease as when in ordinary vocalisation a perfect fixing has been secured for the note sung. And the result is that in such cases we have also for the eye a clearly defined diagram, with sharply cut outlines, so as sometimes (and particularly in the second division of this Class B) to resemble a carefully executed crayon drawing.

With regard to Class C, figures in liquids, as I am not to-day showing any of these, I will only say that, while experiments with this class are subject to the great disadvantage that the appearances displayed are necessarily but momentary and evanescent, liquids are of course extremely sensitive to all impulses, so that it is quite possible for the singing of a note to cause a thin layer of water upon the disc to spring into spray several inches above it; and this sensitiveness has enabled me to observe in this class of figures more than in any of the others indications of differences arising from differences of quality in the notes sung, as distinguished from differences of pitch and of intensity, which can easily be observed in other classes.

But coming lastly to Class D, I may say that it is to it that I have lately devoted most attention, and perhaps I may be permitted to add that the more I have studied these, the more interesting I find them to become, both in regard to their remarkable forms when produced, and to the very strange ways by which they spring into shape.

It is much to my regret that I have not as yet found any means of preserving in their perfection the most complex and beautiful of these forms, and in consequence the specimens I am able to exhibit do not afford an adequate idea of their character; and I am also sorry that a precise account and

explanation of their manners of taking shape would require an extension of this paper to too great a length. Let me, however, direct attention to the figures here shown, belonging to this Class D, in its two divisions, and specially now to those coming under the variety I have called "floral," as also to a few sketches which show roughly some of the stages through which these figures pass before settling down into their final forms.

One general observation, I think, cannot now fail to strike the eye of the observer—viz., that while until now the general character of the figures we have been noticing has been that of geometrical diagrams, we have come to a class of figures of a decidedly different character.

Taking Division D<sub>1</sub>, for instance (figures formed in paste on rubber discs simply), there is something about the general appearance of many of these that seems distinctly "floral," and it needs no effort of the imagination on our part to recognise among these the outlined forms of the forget-me-not and the daisy, as well as in miniature of the sunflower, the marigold, and the chrysanthemum.

The prime characteristic of this variety is a raised centre, surrounded by petals. The numbers of petals I have noticed as 4, 5, 6, 7, 8, 9, 10, 12, 13, 14, 15, 17, 20, 22, 24, 26, and 32, and no doubt others could be added. In arrangement I have noticed that while commonly the petals lie in a single layer around the centre, yet in some cases I have obtained 2, 3, or 4 layers of petals partially overlapping each other, and illustrating exactly the difference we find between some of the composite cultivated flowers of our gardens and the simple wild native varieties. The centres, too, of these tiny floral figures deserve careful examination, as I have often found them to rise in either circular or starlike shape for two, three, or more tiers, the topmost sometimes crowned with a cross.

It is particularly startling that these tiny edifices built up by voice vibrations, far more fragile than "a house of cards," need not even a breath to bring them down, which renders it extremely difficult to preserve them for exhibition.

They require for their production vocal impulses of the greatest delicacy, and in some cases the singer is called upon to employ notes so gentle and subdued that in a concert-room they would altogether fail to be heard.

In this respect the *sub* Division of this Class D, to which we now pass, is quite a contrast, however. In fact, when about to produce this particular description of voice figures, the experimenter is recommended to ascertain, in the first instance, that no musically sensitive neighbours are within earshot.

The figures coming under the Division D<sub>2</sub>, indeed, usually demand for their production the full power of the lungs, as

the voice vibrations have, in this direction of figures, to contend with cohesion of considerable force acting between the rubber-disc, the colour-paste, and the glass plate that are employed.

Still, I think, the results repay the trouble. For here we find ourselves at once in a world of new forms, those arising from cohesion recalling the lovely fretwork traceries of winter upon our window-panes, but with facility given us either to change them at will with kaleidoscopic variety, or to preserve them for further investigation which they seem themselves to invite. (Not only are many of these cohesion figures remarkably beautiful, but it will be noticed that many of them are strangely like representations of natural objects; sometimes caves, rocks, and landscapes, but often the forms of the vegetable kingdom, its foliage, its ferns and its trees, its reeds, rushes, and grasses; and considering the simplicity with which these figures can be produced, either on flat or convex surfaces, it appears probable that they may be found freely applicable to decorative art).

But if into these cohesion figures, in the moment of their formation, there are introduced powerful vocal vibrations, the consequences are yet more strange. What do we get?

Well, first of all, usually, and if the vibrations are only moderate, all that occurs is that, right across the direction of the cohesion lines, there appear a complete and delicate set of wave lines, recording every individual vibration that the voice has caused, such true undulation of the surface of the disc standing registered with strict accuracy, and with a beautiful gentleness that resembles the lines of an extremely delicate engraving.

But if the action of the voice is powerful, and the cohesion force is not too strong, results occur which I must confess try inability fully to account for.

I can only say, that it seems clear that in these cases the cohesion lines are broken up by the voice-created vibrations.

But why, in variety Dc, the results should be so startlingly like leafless trees, alone or in groups, and why, in variety Da, they should be so like to a kind of fern, or to a cactus, but now and then with a semblance of added roots and branches, is what I cannot pretend to determine.

Yet neither can I prevent from presenting itself the thought, whether nature's own myriad ordinary yet beautiful forms, many of which we see here so strangely counterfeited, are not themselves in like manner the resultants of the struggle of vibrations against internal cohesion and external pressure?

Hence, with these few remarks, which I feel to be very inadequate, and in no manner at all exhaustive, upon



a subject that is to me most attractive, permits me to leave it to the further consideration of the Members of this Association.

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### DISCUSSION.

THE CHAIRMAN.—Ladies and Gentlemen, it is evident that we are all agreed that this has been a most interesting paper, and I would ask any lady or gentleman present who may have investigated this subject more than I have, for I confess it is quite new to me, to say a few words upon it.

MR. DEANER.—It is a very interesting subject, but one that I have very little practical acquaintance with myself, although a few years ago I did try some experiments on the vibrations of membranes, with a view to confirm for my own satisfaction some experiments made about the year 1866, I think, by Bourget, and reported in one of the Parisian scientific papers. Mrs. Hughes has, in her interest in this matter, obtained results under very complicated conditions. In case there are any present who desire to work by themselves in this line, I may touch upon one or two conditions to be observed in the simplest form of experiment, which is the only one I practically have any acquaintance with. The experiments by Bourget were made with the view of determining what vibrations a strained membrane could adapt itself to, what were its proper tones, its succession of intervals, and so forth. For this purpose the great aim was to strain the membrane over a hoop in such a manner that it should be disconnected from any resonator which could in any way influence its own proper vibrations. The great objection is that Mrs. Hughes in her experiments combines the diaphragm with a resonator. Taking the membrane only, the results give a series of proper tones utterly distinct from the tones of the harmonic series. The various nodal lines possible with such a strained membrane are diameters—either one diameter or more, on the one hand; and on the other hand, angular divisions by means of nodal circles. These two may be combined so as to obtain segments formed by diameters combined with segments formed by rings. But whatever series is taken, we get nothing approaching the ordinary harmonic series of notes; the intervals are discordant. There are two practical difficulties in the way of such experiments as these. In the first place, there is the difficulty of getting uniform tension. Mrs. Hughes seems to have succeeded very well in many cases with thin India-rubber. I have tried thin paper strained over hoops, and M. Bourget tried the same. The difficulty is to get a size even

straining. Any one accustomed to stain water-colour drawings and things of that kind will know how to do it. The next thing is to get the nodes level. To get the nodal lines fairly defined it is essential to level up the stained diaphragm by means of a builder's level—you could not judge by the eye with anything like sufficient accuracy to get good results. In these interesting experiments of Mrs. Hughes far more complicated conditions are introduced. There is a note or notes proper to the membrane covering the resonator, and there is also a note or notes proper to the resonator itself, and there are notes or a note proper to the two combined, the resonator and the diaphragm. So that although we may get the prime tone of the membrane by means of a vocal impulse (the prime tone being one showing no nodal line—the only nodal line being the circumference) the form would be simply that of the hoop. It may be possible on the same membrane to get a second tone proper to the resonator; it might be discordant with the membrane to such an extent that the scale due to the vibrating membrane would no longer be applicable to such a case as that, and it is quite possible that by adapting the tension and size of the membrane to the contents of the resonator by experiments you could get a succession of tones, that would, at any rate, give you some of the notes of the diatonic scale, which you cannot get with a membrane unattached to a resonator. Again, a given form may be obtained from different notes. Supposing we take a given form produced, we will say by G, on the second line in the treble staff. You could get that form by singing the note an octave below, only the second partial would be the one giving the form originally given by the note of the pitch G, the second line in the treble. Again, you might get the same form by sounding a twelfth below it. In that case it is the third partial of the bass C which is required. So that what Mrs. Hughes suggests with regard to the presence of overtones, from what little I have done in the matter I feel inclined to carry very much farther, and to imagine that in some cases it is an overtone which is causing the figure that we see, and not the prime tone. I understand there are some persons who are in doubt about a certain form representing a certain note, in experimenting with Sadler Taylor's phonoscope. I do not know that particular apparatus, but I know that in experimenting with vibrating membranes simply, for that is all I have done, I find no difficulty whatever in getting exactly the same form with exactly the same note, and with also whatever instrument is tried to produce the note. I have tried different wind instruments and singing, and all give exactly the same form for the same note. Further, we might notice that one of the

results due to slight inequalities in the tension of the membrane is that if a certain form is established with a certain note, and you raise the pitch of that note or lower it in a very slight degree—I do not mean anything approaching a semitone, but merely raise or lower it slightly—it will often happen that the figure will commence travelling round the membrane in one direction or another until it finds a position in which, owing to the tension being irregular, it can adapt itself exactly to the new pitch. I think these cases of travelling forms are easily to be accounted for in this way, that the membrane is not stretched into perfect uniformity, and when you slightly alter the pitch of the note, the sand or whatever is the substance which lies upon it, travels until it attains a position in which the membrane is vibrating in accordance with the new pitch gradually growing out of the old one. Before sitting down, I would only express the great interest I have had in Mrs. Hughes' paper, and the pleasure it has given me to see her work in the matter.

Mr. BENSON.—I have for many years tried to get whatever help I could from science in the treatment of the human voice, and when Professor Sedley Taylor, some years ago, brought this phonoscope under my notice, I was very highly delighted. He told me it would be possible by means of a soap film to get different figures for different pitches, for different degrees of intensity, and for different qualities of tone. It seems to me, there can be no doubt that if we had a little instrument of that kind which would indicate, we will say, differences in the quality of tone in an unmistakable manner, it would be one of the grandest things a teacher could possibly make use of. He would be able to call in the eye to assist the ear; he would have to call the attention of his pupils to certain figures associated with certain qualities of tone, and he would have to get his pupils to look for certain figures, which, of course, would mean certain qualities of tone. I did not find the phonoscope answer in practice. In the first place, there was great difficulty about these films, which would continually burst. In the second place, there was no doubt I did get a variety of figures, and not only that, but a variety of exceedingly beautiful colours. The experiments were most fascinating; but I did not get the same figures regularly for the same changes in either pitch, or intensity, or quality, and, therefore, so far as practical results were concerned, the instrument was of no use. Since then I have not had an opportunity of seeing Mr. Sedley Taylor myself about this matter, but my wife had a conversation with him, and he admitted that his experience had been the same as mine had been. Of course it does not follow because we have

not yet succeeded in these matters we never shall, and it is on that ground that I am delighted to be here this afternoon. I am very much interested in Mrs. Hughes' paper, and it seems to me that everybody connected with the production of the voice in any shape or form ought to do whatever is possible to further these experiments and to assist in them, because I am quite sure we are only at the threshold of these discoveries. I speak feelingly when I say I can appreciate the disappointment experimenters have to go through. Cold water is continually thrown on all these things, people are satisfied with what they have learnt when they were young. We are all apt to run in grooves, and if anybody has the hardihood to come forward and show us anything new, or that we have not found out ourselves, we are inclined to peck-peck it, and give it the cold shoulder. I think that ought not to be. Such experiments as we have witnessed this afternoon are most interesting, and I am sure we are all much indebted to Mrs. Hughes for her very instructive paper.

Mr. SOUTHCOTE.—I should like to ask Mrs. Hughes whether she has experimented with any square resonators, as these are all circular; if so, whether the figures are the same as those produced with the round resonators?

Mrs. HUGHES.—They are the same. The centres of motion are just the same.

The CHAIRMAN.—It now becomes my pleasant duty to propose a vote of thanks to Mrs. Hughes for the very interesting paper we have had this afternoon.

(The motion was carried.)

Mr. STUBBINS.—We are also much indebted to Mr. Baskley for his kindness in reading the paper, and also for the very valuable remarks with which he supplemented that reading. I beg to propose a vote of thanks to Mr. Baskley.

Mr. BEAULIER.—I am much obliged to you, but it was nothing but a pleasure to me to read it.

Mr. PIERCE then proposed a vote of thanks to the Chairman, which was carried unanimously, and the members then proceeded to inspect the various figures exhibited.



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